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# JOINT CHIEFS OF STAFF SPECIAL HISTORICAL STUDY

## A HISTORICAL STUDY OF STRATEGIC CONNECTIVITY 1950 - 1981



HISTORICAL DIVISION  
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THE JOINT CHIEFS OF STAFF  
WASHINGTON, D.C. 20301

SM-183-83

**MEMORANDUM FOR THE DIRECTOR FOR COMMAND, CONTROL AND  
COMMUNICATIONS SYSTEMS**

**Subject: JCS Historical Study "A Historical Study of  
Strategic Connectivity"**

1. The subject study was produced at the request of the Director, C3S. It is intended for internal use only and may be released only under the provisions of JCS MOP 39. Since the content of the study has not been considered by the Joint Chiefs of Staff, it is to be construed as descriptive only and not as constituting the official position of the Joint Chiefs of Staff.
2. Request a copy of this memorandum be affixed to the inside front cover of each copy of the study.

*David O. Swennes*  
DAVID O. SWENNES  
Colonel, USAF  
Acting Secretary, JCS

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A HISTORICAL STUDY  
OF  
STRATEGIC CONNECTIVITY  
1950-1981

Historical Division  
Joint Secretariat  
Joint Chiefs of Staff  
July 1982

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PREFACE

This special historical study was prepared at the request of Lieutenant General Hillman Dickinson, USA, Director for Command, Control, and Communications Systems (C3S), Joint Staff. It traces the development of the systems and procedures that link and provide strategic connection between the National Command Authorities and the nuclear forces.

The study was planned and written by Mr. Willard J. Webb, Chief, Special Projects Branch, Historical Division, Joint Secretariat, Organization of the Joint Chiefs of Staff. Mrs. Barbara C. Fleming, Editorial Assistant, prepared the manuscript for publication.

Valuable assistance was received from the following members of the Command, Control, and Communications Systems Directorate: Mr. Joseph S. Toma of the Evaluation Division; LTC Jessie K. Crawford, USAF, CDR W. C. Bobo, Jr., USN, and CDR Robert M. Rieve, USN, of the Joint Strategic Requirements and Connectivity Division; LTC Mark H. Smith, USAF, and CDR David A. Jones, USN, of the C3 Planning, Programming, and Budgeting Division; and LTC Samuel R. Newland, USAF, and LTC Harvey B. Stevens, USAF, of the Space Warning and Surveillance Division. GEN Richard H. Ellis, USAF (Ret.), former Commander of the Strategic Air Command, supplied helpful information not available elsewhere.

Introduction

(U) The term strategic connectivity has entered the lexicon of military usage only recently. The Joint Chiefs of Staff have defined it as:

the facilities, systems, and procedures that interconnect the National Command Authorities (NCA)<sup>1</sup>, National Military Command System (NMCS), nuclear CINCS, and nuclear executing commanders. It encompasses the NCA, Military Staff Office in the White House, the White House Communications Agency (WHCA), National Military Command Center (NMCC), Alternate National Military Command Center (ANMCC), NORAD warning systems, National Emergency Airborne Command Post (NEACP), CROWN Helicopter operations [USMC helicopters used to move the President], and all links and nodes that interconnect these facilities with the executing commanders of SIOP aircraft, Intercontinental Ballistic Missile (ICBM) Launch Control Centers (LCCs), and Ballistic Missile Submarines (SSBNs).<sup>2</sup>

(U) Although the term is recent, the procedures and systems that compose strategic connectivity are not. Ever since the deployment of nuclear weapons with US military forces, it has been essential to have assured control and connection between those forces and the proper command authorities. Systems and procedures to that end have evolved over the years in accordance with the constantly expanding technology associated with nuclear weapons and the

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1. In the documents used in this study, the terms National Command Authority and National Command Authorities were used indiscriminately. Both JCS Pub 1, the Joint Dictionary of Military and Associated Terms, and DOD Dir 5100.30, which also provides a definition, use the plural form, National Command Authorities. For consistency, National Command Authorities is employed throughout this study except where the singular form is used in a direct quotation and when the term is used as an adjective and the singular is more appropriate.

2. This definition is from a TOR for a study by the Director, Joint Strategic Connectivity Staff (JSCS), contained in (U) Encl to DJSM 2567-80 to Dir, JSCS, 15 Dec 80, JMF 030 (12 Feb 80).

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means for their delivery. From the 1950s onwards, these systems and procedures were included under the designation of strategic command and control (C2) and, later, strategic command, control, and communications (C3). Only in 1978, however, was the term strategic connectivity introduced. At that time, General Richard H. Ellis, USAF, Commander of the Strategic Air Command (SAC), expressed to General David C. Jones, Chairman of the Joint Chiefs of Staff, his concern over the Soviet threat to the strategic command and control and communications links between the President and the Secretary of Defense and the US nuclear forces and proposed a study of "strategic connectivity."<sup>3</sup>

3. (S) Ltr, CINCSAC to CJCS, USecDef(R&E), and ASD(C3I), 23 Sep 78, CJCS File 048 CINCSAC. (U) Interview, Willard J. Webb with GEN Richard H. Ellis, USAF Ret., 6 May 82.

## The 1950s--Emergence of the Pieces

(U) The Soviet Union exploded its first nuclear device in 1949 and the initial US deployment of nuclear weapons to military forces followed two years later. With those events, the United States began to devise and implement procedures and systems to provide command and communication between the President and the nuclear commanders as well as to provide warning and assessment of impending Soviet attack. These actions during the 1950s provided the initial pieces of the strategic connectivity system.

(U) Phenomenal advances in technology occurred during the decade of the 1950s. For the delivery of nuclear weapons, US strategic forces moved from sole reliance on propeller-driven B-29s to jet aircraft and then to a combination of jet bombers and land-based missiles. Finally, missile launching submarines completed the strategic triad. During the years from 1950 to 1960, planned time to prepare for war was reduced from 45 days to 15 minutes. Command and control procedures were gradually changed to support these developments. The Air Force established a command post in the Pentagon in 1949 and an alternate command post was authorized thereafter at Ft. Ritchie, Maryland. In 1959, the Joint Chiefs of Staff set up their own command center, the Joint War Room, subsequently redesignated the National Military Command Center (NMCC). At the same time, the Ft. Ritchie facility was upgraded (and eventually renamed the Alternate National Military Command Center (ANMCC)) to serve as an emergency relocation site for the National Command Authorities and the Joint Chiefs of Staff. Increasingly sophisticated communications, data processing, and display techniques were introduced in these centers to maintain control of strike forces. By the end of the decade, plans were advancing for alternatives to fixed command centers,

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the Navy proposing a National Emergency Command Post Afloat (NECPA) and the Air Force a National Emergency Airborne Command Post (NEACP).

(U) Creation of warning and assessment systems also proceeded. The United States decided in 1953 to build a Distant Early Warning (DEW) System as a precaution against aircraft attacks and the system was completed in 1960. Meantime, in 1954, construction of the Semi-Automatic Ground Environment (SAGE) computerized system for integrating the entire warning and defense network had begun and, by the latter part of the decade, development of both the Ballistic Missile Early Warning System (BMEWS) and satellite reconnaissance systems were underway. All of these systems of the 1950s developed without any overall coordination or plan. The principal concern was to assure the President complete control over any decision to use nuclear forces, but little attention was paid to the need for the systems to remain operational throughout a strategic nuclear exchange.<sup>1</sup>

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1. For detailed consideration of command and control developments during the 1950s, see (TS) IDA Study S-467, "The Evolution of U.S. Strategic Command and Control and Warning, 1945-1972 (U)," Jun 75, OSD Historical Office files.

### The 1960s--Beginning of the System

#### The WWMCCS

(U) The 1960s brought action to bring some overall system and coordination to the area of strategic command and control. Secretary of Defense Robert S. McNamara instituted the first step in October 1962. On the recommendation of the Joint Chiefs of Staff, he approved the establishment of the Worldwide Military Command and Control System (WWMCCS). The object was to bring together all the military resources available to assure the National Command Authorities information on which to make decisions and to allow issuance of execute orders to both strategic and tactical forces in response to an attack against the United States. The new system was to provide survivability, flexibility, responsiveness, standardization, and economy. Its principal component was the National Military Command System (NMCS), comprising the National Military Command Center, the Alternate National Military Command Center, the National Emergency Command Post Afloat, the National Emergency Airborne Command Post, and survivable communications among those facilities and with the unified and specified commands and Service headquarters. The NMCS would be under the management and direction of the Joint Chiefs of Staff, supervised by the Director for Operations (J-3) of the Joint Staff. The other components of the WWMCCS included the subsystems of the Service headquarters, the unified and specified commanders and their component commands, and other DOD agencies and offices that directly supported the command and control function.<sup>1</sup>

1. (U) DOD Directive 5100.30, 16 Oct 62.

(U) Even while the Worldwide Military Command and Control System was being established, advances in weaponry were raising additional threats to the new system. In 1962, the United States conducted the FISHBOWL tests, a final series of high altitude nuclear explosions. The most significant was STAR FISH. It clearly revealed the vulnerability of both ground-based and airborne communications systems to electromagnetic pulse (EMP) from high altitude nuclear bursts. This, in turn, brought into question the survivability of communications systems in a nuclear war and the ability of the National Command Authorities to communicate with and control strategic forces.<sup>2</sup>

(S) Subsequently, in 1963, the Joint Chiefs of Staff drafted the National Military Command System Master Plan to define broad planning guidance for the functional, organizational, and operational relationships among the elements constituting and supporting the National Military Command System as the principal subsystem of the Worldwide Military Command and Control System. The mission was to provide "the National Command Authority with the means essential for accurate and timely decisions, including the communications required . . . , for national direction of US military forces under all conditions of peace and war." The Secretary of Defense approved the plan in June 1964.<sup>3</sup>

(U) The next major event was the initiation of planning in 1966 for the WWMCCS Automatic Data Processing Program to enable the different command centers of the system to transmit and exchange data. Preparation of specifications

2. (C) Interview, Willard J. Webb with Mr. Joseph Toma, C3 Systems Evaluation Div., C3S Dir., 24 May 82.

3. (U) JCS 2308/164, 26 Jan 63; JCS 2308/187, 25 Mar 63; JMF 4930 (15 Jul 62) secs 4 and 5. (S) DOD Dir S-5100.44, 9 Jun 64.

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for competitive procurement began the following year, and the contract for 35 computer systems was finally awarded in 1971.<sup>4</sup>

The MEECN

(2) Simultaneously, development of the Minimum Essential Emergency Communications Net (MEECN) was underway. In June 1966, the Joint Chiefs of Staff provided the Secretary of Defense a consolidated concept plan to provide a survivable communications network for execution of the Single Integrated Operational Plan (SIOP)<sup>5</sup> options in the trans- and postattack nuclear environment. The Secretary gave his approval and the Joint Chiefs of Staff distributed the plan in October of the same year. The Minimum Essential Emergency Communications Net was designed as a last resort communications system to give the President control over nuclear forces. Initially, the Minimum Essential Emergency Communications Net comprised the Navy and Air Force LF/VLF systems, both fixed site and airborne, from the unified and specified commanders to their respective submarine, bomber, and missile nuclear forces combined with the Emergency Rocket Communications System (ERCS).<sup>6</sup>

(3) Thereafter, in July 1969, the Deputy Secretary of Defense decided that the various elements of the Minimum Essential Emergency Communications Net must be integrated into "a single, reliable, and effective communications network" and, to that end, directed the designation of a

4. (b) JCS Hist. Div, The Worldwide Military Command and Control System, A Historical Perspective (1962-1977) (1980), pp. 37-38.

5. The Single Integrated Operational Plan (SIOP) is the JCS plan for the strategic offensive in a nuclear war.

6. Encl B to JCS 2469/483-1, 1 Oct 69, JMF 611 (15 Jul 69) sec 1. Background section, DCS Plan for the MEECN Engineer, 29 Jun 70, same file, sec 2.

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system engineer to insure orderly improvement and maintenance of the Network. The Joint Chiefs of Staff favored assignment of this function to the Navy, but the Deputy Secretary of Defense overruled them and assigned it to the Defense Communications Agency in May 1970. Development of a MEECN System Engineer Plan and an operational concept followed during the remainder of 1970.<sup>7</sup>

(U) During the 1960s changes in US nuclear strategy had important implications for strategic command and control. The Kennedy and Johnson Administrations rejected the massive retaliation approach of the 1950s in favor of a flexible response policy that envisioned limited nuclear exchanges instead of one spasm attack. Moreover, by the late 1960s, the Soviet Union had achieved strategic parity. Now, the United States could no longer count on its nuclear superiority as a defense against nuclear attack. Both of these developments greatly increased the requirement for survivable connectivity between the National Command Authorities and the nuclear forces.

#### Criticisms of the Command and Control System

(U) But, as the requirements increased, growing criticisms and doubts arose over the capability and effectiveness of the existing system. Although there was no actual experience with the strategic command and control system, the LIBERTY, PUEBLO, and EC-121 shootdown incidents in 1967, 1968, and 1969, respectively, raised serious

7. (b) Memo, DepSecDef to Secys of MilDepts, CJCS, and Dir DCA, 15 Jul 69, Att to JCS 2469/483, 17 Jul 69; (C) JCSM-632-69 to SecDef, 14 Oct 69 (JCS 2469/483-1); (C) Memo, DepSecDef to Secys of MilDepts, CJCS, and Dir DCA, 14 May 70, Att to JCS 2469/483-4, 19 May 70, JMF 611 (15 Jul 69) sec 1. (C-GP 3) Memo, Dir DCA to SecDef (thru CJCS), 29 Jun 70, Att to JCS 2469/483-6, 30 Jun 70, same file, sec 2. (C-GP 3) SM-788-70 to Service Chiefs, CINCs, et al., 24 Nov 70 (JCS 2469/483-8), same file, sec 3.

questions about tactical command and control arrangements and the overall system in general. Moreover, a series of tests and studies challenged the adequacy of strategic command and control procedures and system.

~~405~~ In October 1967, the Joint Chiefs of Staff conducted Exercise HIGH HEELS 67 to test the entire spectrum of command in a strategic crisis. The results were not encouraging. The exercise revealed a lack of uniformity with respect to submission of requests by the CINCs for execution of the SIOP and excessive delay in receipt of intelligence and situation reporting. The latter caused delays in the decision on release of nuclear weapons and uncertainty about the US ability to respond in the event of a nuclear attack 8

(U) In 1970, a high-level committee studying organization and operation of the Defense Department, the Blue Ribbon Defense Panel, found responsibility within the Department relating to command, control, and communications and strategic connectivity matters "hopelessly fragmented." This was true in both the Office of the Secretary of Defense and the Joint Chiefs of Staff. "The most obvious weakness of the organization structure," the Panel concluded, "is the absence of unitary management at the top level to assure effectiveness and efficiency from an overall Department of Defense mission point of view . . ." Just before the Panel report was issued, the Secretary of Defense created the position of Assistant to the Secretary for Telecommunications, and the Blue Ribbon Panel viewed that development as a "major improvement."9

8. (TS-GP 1) IDA Report R-131, "An Analysis of Operational Procedures During Exercise HIGH HEELS 67 (U)," Dec 67, JMF 385 (4 Mar 67) sec 2A.

9. (U) Blue Ribbon Defense Panel Report, 1 Jul 70, pp. 28, 145-151.

450. A short time later, the Weapons Systems Evaluation Group (WSEG) reviewed command, control, and communications problems. In the resulting report, issued in February 1971, the Group repeated the finding of the Blue Ribbon Panel. The Worldwide Military Command and Control System, it said, operated in an environment of divided responsibility and independent organizations within the Department of Defense and the overall national security community. More seriously, the Weapons System Evaluation Group charged that the WWMCCS did not maintain an assured capability to alert the President to an attack and to receive and transmit a Presidential decision to execute the Single Integrated Operational Plan. "In a nuclear environment," the report continued,

the WWMCCS is highly vulnerable and can be rendered inoperative by a small portion of the Soviet weapon inventory. Thus it cannot assure the availability of information or warning assessment, attack assessment, and status of forces.<sup>10</sup>

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10. (TS-GP 1) WSEG Report 159, "Command, Control, and Communications Problems (U)," Feb 71, JMF 360 (2 Mar 71) sec 1A.

## The Early 1970s--Reorientation

The Revised WWMCCS Directive

(U) The criticisms and doubts of the late 1960s brought increased attention to the command and control system in the decade of the 70s and a redirection of effort. During 1971, Deputy Secretary of Defense David Packard and Admiral Thomas H. Moorer, Chairman of the Joint Chiefs of Staff, discussed possible improvements in this area. They sat down together in a series of meetings and redrafted the basic Worldwide Military Command and Control System directive to give the system a stronger orientation in support of the President and Secretary of Defense. The new directive, issued on 2 December 1971, clearly stated the primary mission of the system as support of the National Command Authorities. The directive assigned the Chairman of the Joint Chiefs of Staff responsibility to operate the National Military Command System, define its scope and components, develop and validate its requirements, and make recommendations to the Secretary of Defense to insure the responsiveness, functional interoperability, and standardization of the Worldwide Military Command and Control System. In addition, provision was included for a WWMCCS Council, composed of the Deputy Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the Assistant Secretary of Defense for Intelligence, and the Assistant to the Secretary of Defense for Telecommunications, to give policy guidance for the development and operation of the system and to evaluate its performance.<sup>1</sup>

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1. (U) DOD Dir 5100.30, 2 Dec 71.

(S) The new directive eliminated the concept for operation of the system, and the Joint Chiefs of Staff prepared and issued in September 1973 a separate Worldwide Military Command and Control System Objectives Plan. It set forth objectives, based on operational requirements, to guide development of the system. It also contained a list of supporting objectives for use in preparing the command and control portions of the joint strategic planning documents, and an enumeration of issues for further study and improvement. One broad area in the latter category was additional capability to insure positive control of nuclear forces to include more survivable electronic countermeasures for satellite and submarine communications and procedures for preserving continuity of command.<sup>2</sup>

(U) To guide future development of the Worldwide Military Command and Control System, an "architecture" plan was developed. The Chairman of the Joint Chiefs of Staff originally requested the Director, Defense Communications Agency, in December 1973 to produce a target architecture for 1985 and a transition plan to achieve the desired objective. Because of Service disagreements over funding for the project, the WWMCCS Council turned to a contractual arrangement. The IBM Corporation was selected competitively in 1974 to develop the architecture for the Department of Defense. The resulting Worldwide Military Command and Control System Architectural Plan, or "master plan,"

2. (S) SM-433-73 to CINCs, 25 Sep 73; SM-434-73 to Service Chiefs, 25 Sep 73; SM-535-73 to Defense Agencies, 25 Sep 73; (JCS 2308/571), JMF 360 (12 Sep 73). Three days later, the Joint Chiefs of Staff also issued policy guidance and procedural instruction for management of the WWMCCS subsystems. See (U) SM-440-73 to Service Chiefs, CINCs and Defense Agencies, 28 Sep 73 (JCS 2308/574), JMF 360 (13 Sep 73). Both documents were subsequently combined as (FOUO) WWMCCS Objectives and Management Plan, JCS Pub 19, 15 Jul 75, JMF 360 (3 Apr 75) sec 1A.

reviewed by the WWMCCS Council in June 1976, supplied a framework for long-term system development through 1985 and beyond. It was intended to anticipate future requirements for command, control, and communications from the viewpoint of the National Command Authorities and to provide a decision-supporting structure attuned to realities of the late twentieth century. To monitor the implementation of the architecture, the WWMCCS Council chartered the Worldwide Military Command and Control System Engineer (WSE).<sup>3</sup>

~~(S)~~ In January 1974, President Nixon issued a new policy directive (NSDM 242) for nuclear employment planning which reaffirmed and expanded the flexible response policy developed in the 1960s. President Nixon directed that:

The United States will rely primarily on U.S. and allied conventional forces to deter conventional aggression by both nuclear and non-nuclear powers. Nevertheless, this does not preclude U.S. use of both nuclear and non-nuclear weapons in response to conventional aggression.

Consequently, the President wanted US planners to prepare "a wide range of limited nuclear employment options" that could be used in conjunction with supporting political and military measures to control escalation.

~~(S)~~ To insure that nuclear forces were responsive to the National Command Authorities, President Nixon directed that planning for command, control, communications, and surveillance must support decision-making and force execution. As a minimum, he wanted such planning to provide essential support to decision-making and execution of retaliatory strikes in the event of a large attack upon the United States as well as adequate support for decision-making and flexible use of nuclear forces.

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3. (S) JCS Hist. Div., The Worldwide Military Command and Control System, A Historical Perspective (1962-1977) (1980), pp. 67-71. (U) I. Luckom, "Worldwide Military Command and Control System, An Approach to Architectural Development," n.d., JCS Hist. Div. files.

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in attempts to control escalation in local conflict. The President's directive was more demanding in terms of command and control capabilities than previous policies and added new command, control, and communications requirements.<sup>4</sup>

The Evaluation Program

(U) Meantime, in accordance with the 1971 directive, the WWMCCS Council approved implementation of a performance evaluation program to give better appraisal of the weaknesses and requirements of the system. Based on the recommendation of the Joint Staff, the program was to consist of a series of annual JCS general nuclear war exercises under different environments. The first exercise, NICKEL PLATE 74, occurred in May 1974. It represented a total departure from the previous JCS HIGH HEEL exercises, which had been in the nature of training exercises, and simulated a more realistic nuclear environment. In NICKEL PLATE 74, damage or destruction of command, control, and communication systems was imposed on the players in order to evaluate more accurately US ability to execute a response under nuclear attack.<sup>5</sup>

→ The evaluation program also included analytical studies to supplement exercise observations. The first such evaluation, "WWMCCS Performance in a Severe Nuclear Environment," was conducted for the Defense Nuclear Agency by the Stanford Research Institute in August 1975. It was based on the NICKEL PLATE 74 environment and provided the first comprehensive analysis of nuclear and electronic warfare effects of a major Soviet attack on the US command

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4. (TS-EX) Extracts of NSDM 242, 17 Jan 74, JMF 001 (CY 1974) NSDM.

5. (U) Interview, Willard J. Webb with Joseph Toma, C3 Systems Evaluation Div, C3S Dir., 31 Mar 82. (S) J3M-379-74 to SecState, SecDef, Service Chiefs, et al., 18 Feb 74, JMF 385 (4 Jan 74).

and control system. The Stanford Research Institute assessed massive Soviet nuclear attack on the United States under two conditions--an attack when both countries were in a state of full alert and a surprise strike against the United States. The results indicated that it would be possible for the United States to execute nuclear operations in either situation. The effects of electromagnetic pulse, however, were not included in the analysis because of the lack of system response data. The most precarious situation, the Stanford Research Institute believed, would be in the Pacific where it would be necessary to depend on the Emergency Rocket Communications System for timely receipt of emergency action messages. In Europe, needs would be served by airborne command posts in the situation where both countries were fully alert, but this was less certain in the case of surprise attack.<sup>6</sup>

(U) The evaluation program was strengthened in December 1975. At that time, the Director for Telecommunications and Command and Control Systems of the Office of the Secretary of Defense directed a continuing evaluation of the Worldwide Military Command and Control System to include exercises and tests by the Joint Chiefs of Staff, the Services, the unified and specified commands, and other agencies and, in addition, a semi-annual report by the Chairman of the Joint Chiefs of Staff to the WWMCCS Council to appraise the system.<sup>7</sup>

(C) General George S. Brown, USAF, Chairman of the Joint Chiefs of Staff, provided the Secretary of Defense the first WWMCCS evaluation report on 8 June 1976. It covered the six

6. (TS-EX) Stanford Research Institute, "WWMCCS Performance in a Severe Nuclear Environment - Part 2 (U)," Aug 75, C3S files (C3S Evaluation Division).

7. (U) DOD I 5100.80, 1 Dec 75.

months ending on 1 April 1976.<sup>8</sup> Following a briefing to the WWMCCS Council of the Chairman's October 1976 evaluation report, Deputy Secretary of Defense William Clements suggested that the presentation be given to the House Armed Services Committee. Mr. Clements saw an opportunity for added support for Defense budget requests for strategic command, control, and communications systems. General Brown concurred, and the briefing was used in a presentation to the Congressional Committee in early 1977. This event marked an initial step in securing Congressional support for increased funding for strategic command, control, and communications.<sup>9</sup>

(TS) On 17 December 1975, two weeks after the issuance of the formal instruction for evaluation of the Worldwide Military Command and Control System, General Brown directed a review of US strategic nuclear force posture. He wanted command and control covered including such aspects as strategic warning, minimum alert force, prelaunch survivability and communicability, and transattack stability. In response, the Defense Nuclear Agency, at the request of the Joint Staff (J-3) assessed the effects of the Soviet nuclear attacks on the Worldwide Military Command and Control System using the Red Integrated Strategic Operations Plan (RISOP).<sup>10</sup> The study was completed in February 1977.<sup>11</sup>

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8. (U) CM-994-76 to SecDef, 8 Jun 76; (TS-EX) WWMCCS Evaluation Rpt for Period Ending 1 Apr 76, Apr 76; JMF 360 (8 Jun 76).

9. (U) Interview, Webb with Toma, 31 Mar 82.

10. The Red Integrated Strategic Operations Plan (RISOP) is the JCS estimate of an enemy nuclear offensive against the United States based on the latest available intelligence.

11. (TS-EX) CM-747-75 to CNO, 17 Dec 75, Att to JCS 2056/556-1, 14 Jan 76; (C) Memo, Dir, DNA to DJS, 25 Feb 77, Att to JCS 2056/556-5, 4 Apr 77; JMF 399 (7 Oct 75) sec 1.

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The Defense Nuclear Agency study, like the earlier one by the Stanford Research Institute, assessed the Worldwide Military Command and Control System under two possible situations—a massive Soviet nuclear attack when both countries were fully alert and a surprise nuclear strike when the United States was in a state of normal readiness. Under both conditions, "severe" physical damage was inflicted on command, control, and communications systems. Most fixed, land-based primary and alternate command centers and communications systems were destroyed within 30 minutes; distribution of emergency action messages to the nuclear forces depended on airborne elements of the Minimum Essential Emergency Communications Net and the Emergency Rocket Communications System. Moreover, in either situation, airborne elements of the Minimum Essential Emergency Communications Net would be severely hindered by nuclear detonations and electronic warfare attacks against communications systems.<sup>12</sup>

As a result of the Defense Nuclear Agency assessment, the Joint Chiefs of Staff on 11 January 1978 agreed that "assured communications connectivity" between the National Command Authorities and the nuclear offensive forces was "mandatory." More specifically, they said that, "under both day-to-day and generated conditions, there must be sufficient command, control, and communications resources available, either deployed or available for deployment, to insure that the capability to transmit SIOP emergency action messages (EAMs) to SIOP forces exists." To that end, the Joint Chiefs of Staff issued new guidance requiring annual evaluation of the expected effects of an enemy attack on SIOP communications.<sup>13</sup>

12. (TS-EX) DNA Rpt, "WWMCCS Performance Assessment for RISOP-9 INDIA and SIERRA, Including Electronic Warfare (U)," Feb 77, JMP 339 (7 Oct 75) sec 2A.

13. (TS-EX) JCS 2056/556-6, 30 Nov 77, JMP 339 (7 Oct 75) sec 2.

## The Late 1970s—The Coming Together

### The System

(U) By the latter years of the 1970s, an extensive net of systems and procedures was in place to provide the President and the Secretary of Defense control over and communications with US strategic forces. This net comprised three basic elements: warning systems, command centers, and systems to transmit orders and direction to the nuclear forces.

(S) The warning portion of the strategic command and control net included: the Ballistic Missile Early Warning System (BMEWS) with sites in Greenland, Alaska, and the United Kingdom to provide warning and attack assessment of ballistic missile attack over the northern polar cap and northern ocean areas; the Sea-launched Ballistic Missile Detection and Warning (SLBM-D&W) System with sites in Maine, North Carolina, Florida, California, and Oregon to warn against sea-launched ballistic missile attack from US coastal waters; and the Perimeter Acquisition Radar Attack Characterization System (PARCS), located in North Dakota to supply tactical warning and attack assessment on ICBMs. Information from all three systems went to the North American Aerospace Defense Command Cheyenne Mountain Complex for processing and then to the National Military Command System and CINCSAC over the Missile Warning and Display System (MWDS). In addition, there was the Defense Support Program (DSP) of infrared satellite sensors and ground processing stations in Colorado and Australia to warn of missile launches and provide nuclear detonation information. Data went to the North American Aerospace Defense Command, the National Military Command System, and the Strategic Air

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Command via the Command Control Processing Display System (CCPDS). Finally, COBRA DANE, a radar on an island in the Aleutian chain, collected electronic intelligence on Soviet missile launches to Kamchatka and the Pacific area and provided warning and assessment data on ICMSS within its coverage. This information also went to the NORAD Cheyenne Mountain Complex and then to the National Military Command System and the Strategic Air Command over the Missile Warning and Display System.

~~45~~ Three major command centers provided the link that connected the President and the Secretary of Defense with the strategic command and control network. The National Military Command Center (NMCC) in the Pentagon served as the primary command post and had the capability of advising the President and Secretary of Defense and of implementing their decisions. The facility was not hardened against blast or other nuclear effects. The Alternate National Military Command Center (ANMCC) functioned as the primary backup to the National Military Command Center. It was a fixed underground center. The third major center, the National Emergency Airborne Command Post (NEACP), was the backup for the previous two. It supplied the President, the Secretary of Defense, and the Joint Chiefs of Staff a survivable command post capable of continuous execution of nuclear operations and direction of nuclear forces. In 1978, the National Emergency Airborne Command Post aircraft, the E-4A, was not hardened against electromagnetic pulse (EMP). The National Emergency Airborne Command Post's survivability was based on the ability to respond to nuclear attack warning with launch from ground alert prior to SLBM impacts in the Washington, D.C. area.

~~46~~ Other command posts that filled out the strategic command and control net included: the Strategic Air Command (SAC) Underground Command Post, the primary means for direction of SAC forces; the Strategic Air Command Airborne

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Command Post, a continuously airborne command post that functioned as the primary alternate center for CINCSAC; and the North American Aerospace Defense Command Cheyenne Mountain Complex (NAMC), a hardened, fixed, underground command facility that served as a correlating, processing, and disseminating point for tactical warning, attack assessment, and nuclear detonation information. There was also the Post Attack Command Control System (PACCS) consisting of a fleet of 27 EC-135 aircraft. One was the Strategic Air Command airborne command post, and seven more were on ground alert ready for launching in response to warning of nuclear attack. The remainder would be "generated" and placed on ground alert in case of emergency (at DEFCON 3). The unified commanders who had nuclear forces under their command, CINCLANT, USCINCEUR, and CINCPAC, also had airborne command posts. These command posts together with the National Emergency Airborne Command Post were known collectively as the Worldwide Airborne Command Post (WWABNCP) system.

(3) The third major component of the strategic command and control net was the means for transmission of orders from the President and the Secretary of Defense to the nuclear forces. Such orders took the form of emergency action messages (EAMs). The following systems could disseminate emergency action messages:

(1) the JCS Alerting Network (JCSAN), a voice system for both transmission of messages and conferencing, which used the Automatic Voice Network (AUTOVON);

(2) the JCS Improved Emergency Message Automatic Transmission System (IEMATS), a leased special-purpose, alternately routed teletypewriter network (AUTODIN-based) capable of secure record communications from both the Alternate and National Military Command Centers;

(3) the Automatic Digital Network (AUTODIN), a landline system and primary "record system" for dispatch of messages including emergency action messages;

(4) the Tactical Satellite Communications System (TACSATCOM, AFSATCOM), a UHF satellite system that furnished teletype connectivity from the National Emergency Airborne Command Post to the other airborne command post aircraft and the TACAMO aircraft (not protected against jamming);

(5) Airborne Low Frequency/Very Low Frequency (LF/VLF), a means of low speed teletype communications from the Alternate National Military Command Center and the National Emergency Airborne Command Post to the nuclear unified and specified commanders (not protected against jamming, but resistant to nuclear effects);

(6) High Frequency (HF), a system that provided voice and teletype communications from the Alternate National Military Command Center and the National Emergency Airborne Command Post to the nuclear unified and specified commanders;

(7) the Emergency Rocket Communications System (ERCS), a system of six MINUTEMAN missiles with communications systems rather than nuclear warheads that could be launched on east/west trajectories to relay emergency action messages;

(8) the Fixed Submarine Broadcast System, a system that furnished continuous secure VLF/LF and HF broadcasts from fixed shore locations to US submarines at sea;

(9) the TACAMO US Navy aircraft that were airborne VLF relay platforms to provide survivable, continuous communications to fleet ballistic missile submarines.<sup>1</sup>

1. All information on the strategic command and control system in 1978 is from (TS-NOFORN-RD) CINCSAC Study, "C3 Study on Strategic Connectivity, Final Report," 7 Mar 79, JMF 360 (9 Mar 79) sec 1A, and from (S-EX) Navy, "Connectivity Study," Feb 79, Vol. I, JMF 360 (20 Nov 78) sec 1A.

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Studies--OSD Net Assessment Appraisal

—(S) Despite this elaborate system for strategic command and control, growing doubts arose during the last years of the 1970s about the adequacy of this system. In the spring of 1977, the Director of Net Assessment in the Office of the Secretary of Defense prepared an appraisal of US and Soviet command, control, and communications systems. It revealed that the Soviets had made significant advances in this area and presented a formidable threat to the United States.

—(S) The assessment suggested that "a major asymmetry" existed between the United States and the Soviet Union in systems endurance and reconstitution capabilities in the post-attack phase of a nuclear conflict. Moreover, the assessment indicated that US forces were not adequately prepared to meet Soviet and Warsaw Pact countermeasures directed against US command, control, and communications systems, and the result might be a significant military advantage for the Soviets in both theater and strategic warfare. Another area of concern was communications security where US vulnerabilities might substantially enhance Soviet strategic intelligence and warning capabilities. The United States possessed "a commanding lead" over the Soviets in command, control, and communications technology, the assessment continued, but it had not used that advantage effectively. The United States did not have operationally deployed systems that functioned at levels of performance, reliability, and interoperability permitted by its technology. Finally, because of the centralized nature of the Soviet system, the assessment said, the Soviet and Warsaw Pact forces had important advantages in integrated programs and interoperability of equipment for command, control, and communications systems.<sup>2</sup>

—(S) Memo, MilAsst, Office of Net Assessment, OSD to Steering Grp, 2 May 77, C3S files.

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Defense Science Board Study of C3 Management

(U) Later, in September 1977, the Director of Defense Research and Engineering initiated a study of the management of command, control, and communications systems. He asked the Defense Science Board to examine the process by which the Department of Defense planned and procured such systems.<sup>3</sup>

(U) A special task force of the Science Board conducted the study and reported in July 1978. The task force stated:

It is clear that the nation needs command and control systems which would provide substantially better service to our national leaders and our military commanders than the ones we have in place. Our opponents in many circumstances are likely to have forces larger than ours over which we can prevail only with superior coordination and better management, and the potential damage and rapid pace of likely future warfare makes command and control even more essential than ever before.

The basic reason for "new and better" command and control capability, the task force continued, was the changing nature of circumstances where US military power might have to be applied. American interests around the world were likely to require carefully controlled use of force with precise understanding at all levels of command as to what was and was not happening. In addition, the likelihood of future constraints on Defense spending put a premium on securing the most effective use of limited forces. It was clear, the task force believed, that command and control systems could multiply the effectiveness of US forces in many possible confrontations.

(U) The Defense Science Board task force criticized the organization and management arrangements within the Department of Defense for command and control. Systems must

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3. Memo, Dir DR&E to Chm, DSB, 29 Sep 77, JMF 360 (29 Sep 77).

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be interoperable, the task force said, and recommended "a strong central organization," to cut across Service boundaries to manage design and acquisition and to assure compatibility of all systems. The task force proposed the creation of a separate Defense agency for that purpose to report to the Secretary of Defense and to have a relationship within the Department similar to that of the Defense Communications and the National Security Agencies.<sup>4</sup>

#### Defense Science Board Summer Study

~~SECRET~~ Just as the task force completed its study, the Defense Science Board held a "summer study" at the Naval War College during the period 30 July through 11 August 1978. One subject examined was the strategic nuclear balance. The results of the study revealed that, over the past decade, the strategic balance had evolved from net US superiority "in all relevant indices of capability" to a situation currently termed "essential equivalence." In the period of US superiority, the Science Board said, US planners assumed that, if deterrence failed, superior US forces would be adequate for successful conduct of hostilities. Consequently, objectives had been stated as retaliatory goals. Now, the Soviets had closed the gap, the Board continued, and all types of weapons would be needed to fight a prolonged nuclear war. Moreover, the Soviets placed great emphasis on enduring viability of their forces including command, control, and communications throughout a conflict.

~~SECRET~~ The Defense Science Board summer study assessed the capabilities of US strategic nuclear forces including command and control and indicated several major problems. Communications from US warning systems rearward were considered "very fragile" and the current capability to

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4. (U) Rpt of Defense Science Board Task Force, "Command and Control Systems Management," Jul 78, Encl to JCS 2308/814, 17 Oct 78, JMF 360 (29 Sep 78).

react to an attack on those communications was inadequate. Moreover, the Science Board believed that provisions for National Command Authority survival were critically deficient. Given a nuclear attack on the United States when the President was in Washington, it would be possible, the Science Board said, for the President either to command the forces until the attack hit Washington and he was killed or to try to escape and survive, but not both.

(S) The Science Board also identified other problems in the area of strategic command, control, and communications: transmission of emergency action messages depended upon the survival of a very few critical aircraft and assumed that those aircraft were connected with a proper authority identified and authorized to act; and ICBM survival would be increasingly doubtful beginning in the early or mid-1980s when Soviet ICBMs improved in capacity and accuracy. Another weakness, the Science Board said, was the lack of a thought-through plan, with appropriate associated capabilities for a major continuing nuclear war requiring actions that were not preplanned. For example, there was no secure reserve command, control, communications, and intelligence system to support the secure reserve forces. It was apparent, the Science Board concluded, that US strategic command and control systems were designed for

a spasm, SIOP response, with minimal capability to support other strategies.

In sum, the essential and immediate need to support a broader 'deterrence' required increased attention to the war-fighting capability of both our strategic forces and the C3I systems which support them.

(S) To that end, the Science Board recommended that first priority be given to fixing and improving existing systems, particularly improvement of survivability of command, control, and communications systems. The Board made the following specific recommendations with regard to

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command, control, and communications: fix the system so that it worked in peacetime and under attack, strengthen the current fragile system from the warning sensors to the command authority, and improve the probability of successful emergency action message transmission during the initial phase of war to assure that the aircraft (e.g. E-4Bs and TACAMOs) needed for NCA connectivity survived and worked. Other actions considered important were initiation of programs for enduring backup communications between authorities and forces and increased hardening against electromagnetic pulse.<sup>5</sup>

#### Secure Reserve Force Study

While the Defense Science Board studies were in preparation, a review was also in progress within the Department of Defense on the secure reserve force (SRF) which had implications for strategic connectivity. The secure reserve force consisted of nuclear forces that would be reserved during the initial stages of a major nuclear conflict for subsequent protective and coercive uses. Soon after entering office, President Carter had ordered a review of national strategy (PD.NSC-18) and, as a follow-on, the Secretary of Defense, in coordination with the Director of Central Intelligence, was tasked to review the capability required for the secure reserve force. A working group composed of representatives of the Deputy Secretary of Defense for Policy, the Director of Central Intelligence, the Chairman of the Joint Chiefs of Staff, the Under Secretary of Defense for Research and Engineering, and the Assistant Secretaries of Defense for International Security Affairs and Program Analysis and Evaluation conducted

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5. (S-EX) Defense Science Board, Final Report of 1978 Summer Study, "The Strategic Nuclear Balance (U)," 11 Aug 78, JMF 701 (31 Jul 78) sec 1A.

the study, which was completed in October 1978 and forwarded to the National Security Council.<sup>6</sup>

~~(S)~~ The secure reserve force study revealed that the National Command Authorities did not have the communications systems or the means to obtain the information and intelligence required to manage the force. Because of the vulnerability of and lack of endurance in command, control, communications, and intelligence systems, the study questioned the ability of the United States to use the secure reserve after an initial nuclear exchange.<sup>7</sup>

#### The SAC Strategic Connectivity Study

~~(S)~~ In the meantime, General Richard H. Ellis, USAF, Commander of the Strategic Air Command, had become concerned that the United States could not execute the Single Integrated Operational Plan (SIOP) in case of nuclear attack because of weaknesses in the strategic command, control, and communications system. He was particularly worried about the Soviet "Yankee" submarines off the East Coast and the resulting reduction in warning time available to the United States in the event of a missile attack. Warning time, he said, was reduced from 30 to 15 minutes and a high altitude nuclear burst and electromagnetic pulse could even reduce warning time further to 7 minutes.

6. (S) Memo, USecDef (Policy) to CJCS et al., "Secure Reserve Force Target Acquisition Study (S)," 18 Nov 77; (TS-EX) Memo, Dep USecDef (Policy) to DepSecDef, CJCS, et al., "PD-18 Follow-on Studies--Secure Reserve Force (U)," 19 Oct 78; J-5 NSC Affairs Office files. (TS) Memo, Sec Def to USecDef (Policy), "Secure Reserve Force (U)", 28 Oct 78, same file.

7. The SRF study is classified SI-TK. The gist of its findings is contained in (TS) Memo, SecDef to USecDef (Policy), "Secure Reserve Force (U)," 25 Oct 78, J-5, NSC Affairs Office files. Further indication of the content of the 1978 SRF study is gleaned from a 1982 Joint Strategic Connectivity Staff SRF study contained in (TS-EX) Memo, Dir JSCS to DJS, 23 Feb 82, C38 files.

8. General Ellis discussed this concern with General David C. Jones, USAF, the new Chairman of the Joint Chiefs of Staff in early September, when the latter visited the Strategic Air Command. The current Soviet threat measured against strategic command, control, and communications systems and procedures, General Ellis believed, could prevent successful transmission of Presidential directives to the nuclear forces. He used the term strategic connectivity to cover the warning and command and control systems that provided the President and the Secretary of Defense the capability to execute and manage strategic nuclear forces. He intended the term to imply more than just communications systems and proposed a study of this matter.<sup>8</sup>

9. General Jones was persuaded and, upon his return to Washington, proposed that General Ellis undertake such a study. The Secretary of Defense gave his approval. In a discussion of the matter in a meeting of the Operations Deputies on 6 October 1978, the Navy questioned whether a Strategic Air Command study would give adequate attention to connectivity with the naval strategic forces. As a result, the Operations Deputies decided that the Chief of Naval Operations should conduct a companion study of that aspect. Accordingly, the Joint Chiefs of Staff directed both the Commander of the Strategic Air Command and the Chief of Naval Operations to proceed with strategic connectivity studies. The emphasis of both was to be on near term fixes for identified deficiencies; longer term solutions and "programmatic action" would be considered in a separate study by the Defense Science Board.<sup>9</sup>

8. (TS-EX) CINCSAC Command History, 1978, pp. 99-100. (S) Ltr, CINCSAC to CJCS, USD(R&D), and ASD(C3I), 23 Sep 78, CJCS File 048 CINCSAC. (U) Interview, Willard J. Webb with GEN Richard H. Ellis, USAF Ret., 6 May 82.

9. (S) DJSM-1618-78 to CJCS, 6 Oct 78, CJCS File 048 CINCSAC. (C) Msg, JCS 5833 to CNO and CINCSAC, 072035Z Oct 78, JMF 360 (29 Nov 78).

~~(S)~~ A special task group at the Strategic Air Command prepared the SAC strategic connectivity study and General Ellis submitted it to the Joint Chiefs of Staff on 7 March 1979. The Strategic Air Command study group examined the facilities, systems, and procedures that interconnected the National Command Authorities, the National Military Command System, the Strategic Air Command, and the North American Air Defense Command and assessed the capability of existing command, control, and communications systems to perform during all phases of nuclear conflict. The study group found that command, control, and communications systems could not cope with the strategic threat because of architecture deficiencies and lack of durability. The command, control, and communications system supporting the National Command Authorities, the group said, was characterized by a peacetime orientation.

~~(S)~~ The Strategic Air Command group arranged its findings under the three major functional areas--warning, decision, and implementation--necessary for successful direction of the strategic forces. With regard to warning, the group reported that tactical warning and communications systems were available to alert the National Command Authorities, but were "fragile" and susceptible to electronic countermeasures, electromagnetic pulse, and sabotage, which could deny necessary warning and assessment to the National Command Authorities. Moreover, current procedures to route warning information to the National Command Authorities were cumbersome, involving seven major communications nodes. Attack assessment from SLBM warning systems was nonexistent and the study group doubted warning facilities would survive longer than 33 minutes in a nuclear attack against the United States.

~~(S)~~ The major shortfall in strategic connectivity, the Strategic Air Command group found, was in the decision function. Current systems and procedures did not provide

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enduring connectivity among the National Command Authorities, the National Military Command System, and the commanders of nuclear forces. The study group said that the decision time available to the National Command Authorities was compressed by the close geographic proximity of Washington to the SLBM threat and, if the President chose to delay a response decision, execution of a nuclear response could be jeopardized. With current basing and nuclear effects vulnerability, the study group predicted that the National Emergency Airborne Command Post as well as the presidential CROWN helicopters would be destroyed, precluding a viable means of National Command Authority survival. Finally, information systems available to the President and the Secretary of Defense were ground-based and lacked enduring, long-range communications links hardened to survive in a nuclear war. Consequently, force management information would not be available for National Command Authority decisions subsequent to an initial decision to execute a nuclear attack.

~~(b)(1)~~ Much the same situation, the Strategic Air Command study group said, existed with regard to the implementation function. In the execution or termination of operations by strategic nuclear forces, ground communications systems for disseminating emergency action messages had been overlaid on commercial systems and had limited endurance. The National Military Command System facilities, and least of all the National Military Command Center, would not survive a nuclear attack; even the National Emergency Airborne Command Post was vulnerable to electromagnetic pulse and did not provide an assured survivable means for emergency action message transmission.

~~(b)(1)~~ The Strategic Air Command study presented a lengthy series of recommendations, some 120 in all, to remedy these weaknesses. All the recommendations were limited to near term improvements and involved procedures or changes that

could be accomplished with "off-the-shelf" resources currently available. The recommendations ranged from relatively simple actions to elaborate improvements. For example, with regard to reducing the vulnerability of the President at the White House to early destruction by Soviet SLBMs, the recommendations covered a spectrum from relocation of Presidential CROWN helicopters closer to the White House to enhancement of the probability of escape by development of hardened helicopters. For a listing of the specific recommendations, see Annex A. In submitting the strategic connectivity report, General Ellis recommended that the Joint Chiefs of Staff implement the procedural recommendations, that the Services program and implement the near term recommendations, and that the Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence should develop recommendations for long-term system improvements. He also proposed the formation of "a dedicated JCS agency" to conduct "end-to-end" analysis of the effectiveness of facilities, systems, and procedures to support the strategic warning, decision, and execution processes.<sup>10</sup>

#### The Navy Connectivity Study

Simultaneously with the Strategic Air Command study, the Navy had conducted its review of command, control, and communications systems that gave the National Command Authorities the capability to command and execute Navy strategic forces. The study was completed in February 1979 although the Chief of Naval Operations did not forward it to General Jones until 23 July 1979. The Navy reached the same

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10. (TS-NOFORN-RD) CINCSAC Study, "C3 Study on Strategic Connectivity," Final Report, 7 Mar 79, JMF 360 (7 Mar 79) sec 1A.

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general conclusion as had the Strategic Air Command--existing strategic connectivity was inadequate. It had become apparent during the study, the Navy said, that the system which would currently exist at the initiation of either a "generated" or surprise enemy nuclear attack would degrade rapidly to "a very small residual system." Using the current JCS estimate of an enemy nuclear attack (the Red Integrated Strategic Operation Plan (RISOP) 5C), the Navy study indicated that such an attack would destroy approximately 90 percent of the ground based elements of the Worldwide Military Command and Control System within 15 minutes of the attack initiation. Even satellite space segments could be lost to electromagnetic pulse or direct physical damage, and the residual system remaining after the initial attacks would be assets of the Worldwide Airborne Command Post (WWABNCP).

~~(b)~~ In the post-attack period, the Navy estimated that connectivity to USCINCEUR and CINCPAC would remain tenuous. Survival and continued availability of a fully-capable TACAMO relay aircraft in the Western Atlantic would provide connectivity to USCINCEUR and CINCPAC and improve the chances for delivery of National Command Authority orders to fleet ballistic missile (FBM) forces at sea. Should TACAMO capabilities be degraded or lost, the Navy study continued, connectivity to either USCINCEUR or CINCPAC would be reduced to periodic communications delivered by sorties of aircraft normally part of the Post Attack Command and Control System (PACCS) chain over the continental United States.

~~(b)~~ Like the Strategic Air Command Study, the Navy restricted considerations for improvement to immediate and "near-term fixes" to identified deficiencies. Recommendations were made in three major areas: protection of the TACAMO system, improvements in the connectivity from the nuclear commanders to airborne TACAMO aircraft and nuclear submarines (SSBNs), and improvements in the connectivity

between nuclear commanders. For a listing of specific recommendations, see Annex B.<sup>11</sup>

(U) The two studies, the Strategic Air Command and Navy, became known collectively as the JCS Strategic Connectivity Study. It represented the first time that strategic connectivity had been addressed in manageable terms with specific recommendations for improvements. Heretofore, study recommendations, such as those by the Defense Science Board, had been in broad generalities.<sup>12</sup>

#### Defense Science Board Study of Enduring C3

~~(S)~~ The JCS directive to both the Chief of Naval Operations and the Commander of the Strategic Air Command had restricted their strategic connectivity studies to short-term problems and improvements. Longer term issues were to be the subject of a complementary effort by the Defense Science Board. Accordingly, the Under Secretary of Defense (Research and Engineering) requested the Chairman of the Science Board to form a special task force for that purpose. It was to use the earlier "Summary Study" on strategic nuclear balance<sup>13</sup> as the point of departure.<sup>14</sup>

~~(S)~~ The task force completed its study of "Enduring Strategic Communications, Command, and Control" on 10 October 1979. It made a distinction between survivability and endurance. The former was the ability to withstand a nuclear attack; the latter was the ability to operate for a long time in the face of a set of attacks. The Defense Science Board task force was primarily

11. ~~(S)~~ Navy, "Connectivity Study," Vol I, Feb 79, JMF 360 (20 Nov 78) sec 1A.

12. (U) Interview, Willard J. Webb, JCS Hist. Div., with LTC Jessie K. Crawford, USAF, JSR Div., C3S Dir., 12 Feb 82.

13. See above, pp. 25-27.

14. ~~(S)~~ Memo, USecDef(R&E) to Chm, DSB, "Terms of Reference for Task Force on Enduring Strategic C3 (U)," 2 Nov 78, App to DSB Report, "Enduring Strategic Communications, Command and Control (U)," 10 Oct 79, C3S files.

concerned with endurance although it recognized that endurance included survivability as a special case. The task force found serious weaknesses in the endurance of US strategic command, control, and communications systems, particularly in the post-attack phase. It doubted that an enduring system would result from the programs as then under way or proposed. It believed a fundamentally different approach was needed, one that used large numbers of existing assets rather than building a few new ones.

~~(b)~~ The task force reached the following conclusions with regard to the future requirements for command, control, and communications systems: designs must emphasize flexibility against a multitude of situations and not "optimization against some approved threat or scenario"; redundancy, proliferation, and diversity were preferable to specialization; emphasis should be on enduring capability to perform a function rather on survivability of specific facilities; and realistic systems tests and exercises were absolutely necessary.

~~(c)~~ The task force examined strategic command, control, and communications in three time periods of conflict--pre-attack, trans-attack, and post-attack--and made the following recommendations: pre-attack--toughen communications and establish explicit procedures for raising alert status of strategic command, control, and communications systems based on warning information; trans-attack--increase the number of airborne command posts, proliferate communications to forces, and clarify the role of the military in seeking and supporting the National Command Authorities; and post-attack--review and extend procedures for reorganizing military command structure from surviving senior military officers, develop procedures and facilities to reconstitute rapidly a narrow band, nationwide communications network from surviving assets, and plan for

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and practice use of surviving sensor, communications, and command post assets under post-attack conditions.<sup>15</sup>

Actions to Strengthen Command, Control, and Communications

(U) The various studies and reviews in the period 1977 through early 1979 succeeded in bringing about an awareness of the fragile condition of strategic connectivity. As a result, the Joint Chiefs of Staff and the Secretary of Defense recognized the need to do more to guarantee the National Command Authorities enduring command and control of strategic forces in the event of a nuclear conflict. Now, they began to give increased attention and emphasis to the systems and procedures that linked the President with the strategic forces.

The Command, Control, and Communications Systems Directorate

(U) The first such action was the creation of a Joint Staff directorate to oversee command, control, and communications matters. The Defense Science Board study in the summer of 1978<sup>16</sup> had criticized the management of command and control systems and had proposed a central organization within the Department of Defense for that purpose. Specifically, the Defense Science Board study had recommended a new Defense agency or, if that alternative was not "propitious," expansion of the Defense Communications Agency. In implementation of that recommendation, the Deputy Under Secretary of Defense for Research and Engineering directed the Defense Communications Agency to plan an expansion of its charter to provide Defense-wide

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15. ~~SECRET~~ DSB Task Force Report, "Enduring Strategic Communications, Command and Control (U)," 10 Oct 78, C35 files.

16. See above, p. 24-25.

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management of command, control, and communications systems.<sup>17</sup>

(U) The Joint Chiefs of Staff, however, did not agree. After reviewing a Defense Communications Agency plan for command, control, and communications management, they told the Secretary of Defense on 3 April 1979 that "the delineation, scope, and range of responsibilities" of the proposal were based on "a limited view of command and control system management problems." The Joint Chiefs of Staff recommended the assignment of only a limited architectural role of joint command and control systems to the Defense Communications Agency, and that broad responsibility for planning and establishing command and control systems interoperability be assigned to them.<sup>18</sup>

(U) In pursuit of that recommendation, the Chairman of the Joint Chiefs of Staff, General David C. Jones, USAF, proposed the establishment of a Command, Control, and Communications Systems (C3S) Directorate within the Joint Staff. The Secretary of Defense accepted the Chairman's proposal on 17 April 1979 and the new directorate was established on 30 May. It was charged with developing policies, plans, and programs to insure adequate command, control, and communications support to the unified and specified commands and the National Command Authorities for joint and combined military operations; with "conceptualizing" future command, control, and communications systems design; and with providing direction to improve command and control. (For the Command, Control, and Communications Directorate charter, see Annex E.)<sup>19</sup>

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17. (U) Memo, Principal DepUsecDef(R&E) to Dir DCA, 9 Nov 78, Att to JCS 2308/814-1, 16 Nov 78, JMF 360 (29 Sep 78).

18. (U) JCSM-93-79 to SecDef, 3 Apr 79 (JCS 2308/824-1), JMF 360 (29 Sep 78).

19. (U) JCS 1977/149, 25 May 79; JCS 202/208, 30 May 79; JMF 026 (25 May 79).

(U) Meantime, the Secretary of Defense had already taken similar action to strengthen management of command, control, and communications matters in his office. In March 1977, he had established an Assistant Secretary for Communications, Command, Control, and Intelligence (C3I) to serve as his principal staff assistant in that area.<sup>20</sup>

#### Review of Connectivity Studies

~~(S)~~ In a further effort to bolster strategic connectivity, the Deputy Secretary of Defense on 29 August 1979 asked the Joint Chiefs of Staff to review the recently completed Strategic Air Command and Navy studies<sup>21</sup> and recommend improvements in strategic connectivity. The Joint Chiefs of Staff provided their response on 1 October 1979. They viewed the Strategic Air Command study as "a useful baseline" from which to pursue essential improvements. They endorsed all 120 recommendations of the study except for one calling for placement of a North American Aerospace Defense Command representative on the National Emergency Airborne Command Post. Such an action, they felt, was unwarranted. Forty-one of the Strategic Air Command recommendations, the Joint Chiefs of Staff told the Secretary of Defense, were currently being addressed by their organization, the Services, and the Defense agencies for implementation while 57 more required further examination by those same organizations as well as the Commanders of the Strategic Air and Aerospace Defense Commands. (For JCS comments and recommendations on each Strategic Air Command recommendation see

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20. (U) DOD Dir 5137.1, 11 Mar 77. This position evolved from an Assistant to the Secretary of Defense (Telecommunications) created in 1970, changed to the Assistant Secretary of Defense (Telecommunications) in 1972, who subsequently became the Director, Telecommunications and Command and Control Systems, in 1974.

21. See above, pp. 28-34.

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Annex C.) The Joint Chiefs of Staff asked the Secretary of Defense to provide support for the following improvements: (1) deployment of a survivable space-based sensor system capable of providing impact points; (2) two additional PAVE PAWS sites and power upgrade to provide assessment; (3) deployment of programmed Defense Support Program (DSP) mobile ground terminals with survivable communications; (4) deployment of a space-based sensor system with onboard processing and direct communications to ground-based and airborne users; (5) an Air Force tanker procurement program to include full support for the Airborne Warning and Control System; (6) a space-based surveillance system to counter the threat of low-altitude cruise missiles; (7) direct transmission of sensor data to the National Military Command System and the Strategic Air Command; (8) final operational capability by 1985 for a six-aircraft fleet of E-4Bs; (9) strategic satellite systems and adaptive High Frequency programs; (10) procurement of 100KW low frequency/very low frequency transmitters and complete implementation of the Air Force Satellite Communications (AFSATCOM) program aboard postattack command and control system EC-135 aircraft; (11) the Navy TACAMO Improvement Program to insure compatible low frequency/Air Force Satellite Communications System capability. They also wanted the Secretary to secure Presidential authorization for the following actions: JCS determination of National Emergency Airborne Command Post basing, subject to the Presidential response guidelines; support for placing the Vice President on the National Emergency Airborne Command Post at DEFCON 2; and consideration of alternative basing for the Presidential CROWN helicopters.<sup>22</sup>

22. ~~(S-EX)~~ JCSM-291-79 to SecDef, 1 Oct 79 (JCS 2308/846-1), JMF 360 (7 Mar 79).

~~SECRET~~ The Joint Chiefs of Staff also endorsed the Navy strategic connectivity study. Of the twenty-two recommendations contained therein, the Joint Chiefs of Staff had directed implementation of eleven by the Chief of Naval Operations, CINCLANT, and CINCPAC; nine more required further consideration by their organization, CINCSAC, or the Defense Communications Agency; and action had already been initiated on the remaining two. (For a listing of the recommendations and the JCS recommendations on each, see Annex D). The Joint Chiefs of Staff requested the Secretary to supply funds to implement those recommendations that could not be accomplished within present program funding.<sup>23</sup>

(U) The recommendations of the Strategic Air Command and Navy connectivity studies were for short-term improvements, and their implementation in the following months began to strengthen the systems and procedures that linked the National Command Authorities with the strategic forces. In addition, several organizational developments occurred that were designed to enhance strategic connectivity further.

#### The Joint Strategic Connectivity Staff

(U) At the urging of General Ellis, the Strategic Air commander, and General Jones, the Joint Chiefs of Staff established the Joint Strategic Connectivity Staff (JSCS) in February 1980. In proposing such an entity, General Ellis envisioned an organization to monitor strategic connection at an operational level as distinct from the Command, Control, and Communications Systems Directorate of the Joint Staff which was responsible for planning and coordinating all command, control, and communications systems including those that supplied strategic connectivity. The Joint

23. ~~SECRET~~ JCSM-290-79 to SecDef, 1 Oct 79  
(JCS 2308/821), JMF 360 (20 Nov 78).

Strategic Connectivity Staff was an agency of the Joint Chiefs of Staff located at the Strategic Air Command Headquarters. It was to give operational and user focus to tactical warning and attack assessment, conferencing, emergency action message dissemination, and force status and reporting--the systems that provided strategic connectivity. The new Staff would develop software and hardware and procedural recommendations to insure interoperability, reliability, survivability, endurance, security, and efficiency to those systems. In addition, it would coordinate and review connectivity and operational procedures among and between the National Command Authorities, the National Military Command System, and the nuclear commanders. It would also recommend exercises to test procedures.

(U) The Joint Chiefs of Staff named General Ellis the Director of the Joint Strategic Connectivity Staff, in addition to his duties as Commander of the Strategic Air Command. For the new responsibility, he reported directly to the Chairman of the Joint Chiefs of Staff. (For the Terms of Reference for the Joint Strategic Connectivity Staff, see Annex F.)<sup>24</sup>

#### The Strategic Connectivity Engineering Office

(S) Following the establishment of the Joint Strategic Connectivity Staff, the Command, Control, and Communications Systems Directorate of the Joint Staff saw a need for a "complimentary" system engineering effort to assure the survival of minimum essential communications for strategic

24. (U) JCS 1977/424, 12 Feb 80; JCSM-58-80 to CINCSAC, 3 Mar 80 (JCS 1977/424); JMF 030 JSCS (12 Feb 80). Washington Star, 2 Aug 80, D14. (U) Interview, Willard J. Webb with GEN Richard H. Ellis, USAF Ret., 6 May 82.

connectivity. Since the Director of the Defense Communications Agency served as the system engineer for the Minimum Essential Emergency Communications Net (MEECN), the Director of the Command, Control, and Communications Directorate asked the Defense Communications Agency on 7 October 1980 to recommend the best way to achieve a MEECN-like focus on strategic connectivity.<sup>25</sup> Subsequently, on 23 January 1981, the Director of the Defense Communications Agency submitted a plan calling for expansion of the MEECN system engineering efforts of the Command and Control Technical Center (CCTC) in his Agency to include essential communications support to all emergency action functions in order to accomplish a system engineering approach to essential communications connectivity.<sup>26</sup> Thereafter, on 16 February 1981, the Director, Defense Communications Agency, created the Strategic Connectivity Engineering Office (SCEO) within the Command and Control Technical Center for that purpose. This office would focus on the functional areas of tactical warning and attack assessment, decision conferencing, and force management to determine, initially, the minimum essential connectivity requirements and then to take MEECN-like actions to provide survivable and enduring systems for those requirements. Later, the Minimum Essential Emergency Communications Net responsibilities would be incorporated into the strategic Connectivity Engineering Office as appropriate.<sup>27</sup>

25. ~~U(S-EX)~~ C3S-M-693-80 to Dir DCA, 7 Oct 80, C3S files.

26. ~~U(S-EX)~~ Memo, Dir DCA to Dir C3S, 21 Jan 81, C3S files.

27. ~~U(S-EX)~~ Memo, Dir DCA to Distribution, "DCA Support to Strategic Connectivity Upgrading," 10 Mar 81, C3S files.

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### Presidential Decisions

(U) While these organizational developments were in process, President Jimmy Carter reached several policy decisions that gave added importance to and priority for strategic connectivity. President Carter, a former naval officer, had served on a nuclear submarine and was more conscious of the problems of strategic command and control than any previous president.<sup>28</sup> After entering office, he, personally, participated in several command and control exercises. In a decision on 15 November 1979, Presidential Directive 53, he set out the requirement for a survivable communications system as a component of deterrence. United States policy, he said, must provide for "connectivity between the NCA and strategic and other appropriate forces to support flexible execution of retaliatory strikes during and after an enemy nuclear attack."<sup>29</sup>

Subsequently, Presidential Directive 58 of 30 June 1980 on continuity of government recognized the need to insure the survival of the Presidency under "the most stressing conditions" (extended nuclear attack) to provide connectivity between the National Command Authorities and the strategic and other forces appropriate for flexible execution of retaliatory strikes during and after an enemy nuclear attack, and to give response support for National Command Authority operational control over the armed forces, even during protracted nuclear conflict.<sup>30</sup> Three weeks later, on 25 July 1980, President Carter issued a new nuclear weapons employment policy (Presidential Directive 59). Among other things, the President stated that "strategic stability in an era of essential equivalence

28. (U) Interview, Willard J. Webb with GEN Richard H. Ellis, USAF Ret., 6 May 82.

29. (U) Extracts of PD/NSC-53, 15 Nov 79, JMF 001 (CY 79).

30. (TS-EX) Extracts of PD/NSC-58, 30 Jun 80, JMF 001 (CY 80) sec 2.

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depends as much on survivability of C3I capabilities as it does on the size and character of strategic arsenals.<sup>31</sup>

The NORAD False Alerts

(U) In the same period as these Presidential directives, false missile warnings at the North American Aerospace Defense Command Cheyenne Mountain Complex brought adverse public attention to the strategic command, control, and communications system. As a consequence, however, actions were taken to improve tactical warning and assessment.

(U) On 9 November 1979, an exercise tape was mistakenly inserted into the operational computer system at the Cheyenne Mountain Complex. This caused missile warning displays at the Strategic Air Command, the National Military Command Center, and the National Emergency Airborne Command Post, and US forces in North America were placed on alert for about ten minutes before the error was confirmed. To preclude a reoccurrence, the Commander of North American Aerospace Defense established a review board to look into the incident and instituted stringent testing regulations. In addition, an offsite facility was designed so that testing of both hardware and software as well as training could be done separately from the operational computer system.<sup>32</sup>

(S) A little over six months later, on 3 and 6 June 1980, false missile warning indications reoccurred at the Cheyenne Mountain Complex and appeared on the Strategic Air Command and National Military Command Center displays.

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31. (TS-EX) PD/NSC-59, 25 Jul 80, JMF 001 (CY 80) sec 3.

32. (U) Washington Star, 10 Nov 79, A1. (U) Statement by LTG James V. Hartinger, USAF, CINCNORAD/CINCAD, in Hearings, Failures of the No. Am. Aerospace Defense Command's (NORAD) Attack Warning System, H. Sub-cmte on Gov't Operations, 19 and 20 May 81, 97th Cong, 1st sess, pp. 115-125 (hereafter cited as Hearings, Failures of NORAD Attack Warning System). (S-EX) CINCAD Command History, 1979, pp. 77-81.

Again, it was quickly determined that the warnings were erroneous. The North American Aerospace Defense Command investigated and determined that a computer chip was at fault. The particular chip as well as other critical chips were replaced and circuit boards were redesigned to prevent any repeat incidents.<sup>33</sup>

#### The Leaf Report

(5) Following the June incidents, General Lew Allen, Jr., Chief of Staff of the Air Force, ordered a review of all aspects of the tactical warning and attack assessment system. The US Air Force Inspector General, Lieutenant General Howard W. Leaf, conducted the review assisted by a group composed of representatives from the Strategic Air and Aerospace Defense Commands and other appropriate Air Force commands. General Leaf submitted his report in early September 1980. His principal finding was that the US Air Force did not recognize or manage tactical warning and attack assessment elements as a complete system. This condition caused divided approaches to acquisition, interface, and management of elements; a lack of "end-to-end" direction for operations concepts, doctrine, and procedures; and the absence of a reporting requirement for tactical warning and attack assessment systems and subsystems. General Leaf made a number of recommendations, the most significant of which called for a warning and assessment management organization that included a directive to recognize tactical warning and assessment as a total system and an engineer organization for that system.<sup>34</sup>

33. Hartinger statement, Hearings, Failures of NORAD Attack Warning System, pp. 115-125. Baltimore Sun, 6 Jun 79. "Recent False Alerts from the Nation's Missile Attack Warning System," Rpt by Senators Gary Hart and Barry Goldwater to S. Com on Armed Services, 9 Oct 80, 96th Cong, 2d sess, pp. 5-9.

34. US-AF Rpt, IG USAF, "Special Management Review of USAF Support to the Tactical Warning/Attack Assessment System," 3 Jul-2 Sep 80, C3S files.

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(S) The Air Force Chief of Staff, General Allen, approved the recommendations for establishment of a tactical warning and attack assessment management organization on 8 October 1980.<sup>35</sup> He named the Commander of the Aerospace Defense Command the executive manager for the Air Force for the tactical warning and attack assessment system with overall responsibility for management and control of the system end-to-end and for review of all changes thereto. Also established, effective 1 January 1981, at the Aerospace Defense Command Headquarters, was the System Integration Office (SIO). It was charged with functional responsibility for the architecture, development and maintenance, subsystems interface and engineering, testing, development, and acquisition of the tactical warning and attack assessment system.<sup>36</sup>

#### The JCS Umbrella Study

(S) Meantime, the Chairman of the Joint Chiefs of Staff had also directed a similar review. On 15 July 1980, he asked the Command, Control, and Communications Systems Directorate to conduct an "umbrella" study of the total tactical warning and attack assessment system. He wanted shortfalls identified and improvements recommended. The Command, Control, and Communications Systems Directorate published its report, known as the "Umbrella Study," on 6 February 1981. It reviewed previous studies dealing with warning and assessment. First, the Umbrella Study placed

35. (S) Memo, CSAF to CINCSAC, CINCAD, et al., "Implementation of Recommendations in the Special Management Review of USAF Support to the Tactical Warning and Attack Assessment System," 8 Oct 80, C3S files.

36. (U) Hqs, USAF PMD No. R-8 1044(1)/12313F, "Program Management Directive for the Ballistic Missile Tactical Warning/Attack Assessment (TW/AA) System," 19 Mar 81. (U) SIO, Ballistic Missile TW/AA System Management Plan for System Integration, 19 Mar 82, pp. 16, 20-21, C3S files. (U) Interview, Willard J. Webb with Robert Kipp, Command Historian, ADC, 29 Apr 82.

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all previous recommendations and findings from earlier reviews into six major substantive groupings: sensors, communications systems, computers, display systems, procedures, and personnel management. Then it assigned each of these recommendations to one of four evaluation categories: (1) gaps - where recommendations were not being addressed, but where action was needed; (2) shortfalls - where some action had been taken, but where more was needed; (3) valid and ongoing recommendations - where progress was being made; (4) recommendations not being done - where no action had been undertaken and where the Study concurred that nothing was required. In addition, the Umbrella Study included new recommendations that identified deficiencies not addressed by previous recommendations. In all, the Study presented 78 recommendations that needed attention and 71 that were ongoing. These broke down as follows:

	Sensors	Communi- cations	Computers	Display Systems	Procedures	Pers/ Total Mgmt	Total
Gaps	14	6	4	10	3	3	40
Short- falls	10	13	6	5	4	0	38
Ongoing	15	15	8	6	16	11	71

(For a listing of the recommendations, see Annex G).

(S) The Umbrella Study recommended that the Chairman of the Joint Chiefs of Staff should task identified agencies to take appropriate action on recommendations in the "gap" and "shortfall" categories. The Study also urged support of the Leaf report recommendations concerning management of tactical warning and attack assessment. In this regard, the Umbrella Study pointed out that the tactical warning and attack assessment system included segments beyond the control of the Air Force, specifically the tactical warning

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and attack assessment communications interfaces and displays, elements under the unified and specified commands, and responsibilities assigned to the Defense Communications Agency. The Study proposed that the Chief of Staff of the Air Force be designated the JCS executive agent for overall system integration to include interface with the unified and specified commands and the Defense Communications Agency.<sup>37</sup>

(U) Thereafter, on 5 May 1981, the Chairman did direct the Joint Strategic Connectivity Staff to monitor the improvements "specified" in the Umbrella Study and pursue their "resolution."<sup>38</sup> Several months later, on 17 August 1981, the Joint Chiefs of Staff designated the Chief of Staff of the Air Force as their executive agent for technical integration of the tactical warning and attack assessment system.<sup>39</sup>

~~40~~ As a further result of the June 1981 false warning alerts, the Assistant Secretary of Defense (C3I) asked a team of experts from outside of the Department of Defense to look into the technical aspects of the North American Aerospace Defense Command computer system. The team, headed by Mr. B.O. Evans, Vice President of the IBM Corporation, made a series of recommendations for both hardware and software improvements to enhance further the reliability of the NORAD warning systems. These recommendations were carried out in the ensuing months and did bring improvements.<sup>40</sup>

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37. ~~40~~ C3S, "OJCS Tactical Warning/Attack Assessment (TS/AA) Study Group Final Report" (Umbrella Study), 6 Feb 81, C3S files.

38.(U) CM-911-81 to Dir JSCS, 5 May 81, C3S files.

39. (U) SM-569-81 to CSA, CSAF, et al., 17 Aug 81 (JCS 2308/936); JCSM-307-81 to SecDef, 17 Aug 81 (JCS 2308/936); JMF 361 (29 Jul 81).

40. ~~40~~ Ltr, B.O. Evans, IBM to Dr. Harry Van Trees, Principal Dep ASD (C3I), 20 Nov 80, C3S files. (U) Interview, Willard J. Webb with LTC H.B. Stevens, Space Warning and Surv. Div., C3S Dir., 3 May 82.

(U) Despite the enhancement in warning and assessment brought about by action resulting from the November 1979 and June 1980 incidents, not everyone was convinced that the improvement was sufficient. The acting Comptroller General of the Government Accounting Office, Mr. Milton J. Socolar, questioned the ability of the North American Aerospace Defense Command to perform adequately its missile warning and space surveillance mission. In Congressional testimony the following spring, he attributed the problems experienced in the North American Aerospace Defense Command computer development program to "poor planning and poor management and the attempt to force-fit user requirements to a particular type of equipment." He claimed to have documented in over 100 reports since 1965 the failure of the Department of Defense, the Joint Chiefs of Staff, and the Services to plan for effective automatic data processing procurement and implementation, to identify user needs, to develop function specifications, to provide centralized acquisition management, and to establish adequate accountability.<sup>41</sup>

#### The Morgenstern Initiatives

Meantime, in early 1980, a panel convened by the Joint Chiefs of Staff had concluded that the effects of high altitude electromagnetic pulses could "severely jeopardize" the capability to execute the Single Integrated Operational Plan. A working group in the Office of the Secretary of Defense reviewed the panel's work and concurred in the findings. As a result, Lieutenant General Hillman Dickinson, USA, Director of the recently established

41. (U) Statement, Milton J. Socolar, Hearings, Failures of NORAD Attack Warning System, pp. 3-5. (U) Report, GAO to House Cmte on Gov't Operations, NORAD's Missile Warning System: What Went Wrong?, 15 May 81, JMF 392 (11 May 80).

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Command, Control, and Communications Systems Directorate of the Joint Staff, and Mr. John Morgenstern of the office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) briefed the Worldwide Military Command and Control System (WWMCCS) Council on this matter on 28 July 1980. They presented proposed "fixes" to harden essential components of strategic command, control, and communications systems against high altitude electromagnetic pulses. These components included: airborne command post aircraft, both the E-4A and EC-135; TACAMO relay aircraft; command centers; dedicated landlines; high altitude nuclear detection (HAND) sensors; and Defense Satellite Communications System (DSCS) terminals. Mr. Morgenstern subsequently addressed the hardening of each of these components individually with the concerned Service, and actions were taken to include the required funding in the Service budgets.<sup>42</sup>

(S) Another development that emphasized the need for enduring strategic connectivity was consideration of a building block approach to planning for employment of nuclear weapons. In reviewing draft nuclear weapons guidance in late August 1980, the Joint Chiefs of Staff objected to a proposal that called for development of a set of "situation-responsive, objective-oriented" building block options for use of nuclear weapons. The Joint Chiefs of Staff believed the concept was poorly defined and beyond the capability of current planning and systems, including those for command, control, and communications.<sup>43</sup>

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42. (S) WWMCCS Council Working Paper, "Strategic C3 Survivability," Executive Summary, n.d. (Jul 80); (U) WWMCCS Council Agenda, 28 Jul 80; C3S files. (U) Interview, Willard J. Webb with Mr. Joseph Toma, C3 System Evaluation Div., C3S Dir., 24 May 82.

43. (TS-EX) JCSM-237-80 to SecDef, 29 Aug 80 (JCS 2430/349-1), JMF 721 (11 Aug 80).

~~(S)~~ In response to the JCS objection, the Secretary of Defense did delete the building block concept from the guidance. He considered it "essential," however, to pursue the matter. He directed the Joint Chiefs of Staff, with assistance from his office, to prepare a building block concept to provide "increased flexibility in planning and employment of nuclear weapons--to provide the National Command Authorities with a mosaic of viable alternatives rather than the relatively large aggregated attack options of current SIOP planning." He wanted a plan for implementation consistent with US force and command, control, and communications capabilities.<sup>44</sup> The Joint Chiefs of Staff prepared a study for this task and steering and working groups were appointed, but preparation of the actual plan has not been completed.<sup>45</sup> Nonetheless, consideration of the building block concept has included recognition that additional command, control, and communications capabilities will be required.

#### Budget Increases for C3

(U) The various studies on strategic command and control as well as the North American Aerospace Defense Command false warnings and the publicity associated with them brought increased attention to strategic connectivity both within the Department of Defense and in the Administration. This attention extended to the Congress as well where there was growing awareness of the problems associated with control of nuclear weapons. Beginning in 1977, information from the Chairman's semi-annual evaluation of command

44. (C) Memo, SecDef to CJCS, 24 Oct 80, Att to JCS 2430/349-3, 28 Oct 80; (S) Memo, SecDef to CJCS, 23 Dec 80, Att to JCS 2430/349-5, 2 Jan 81; JMF 721 (11 Aug 80).

45. ~~(S)~~ JCSM-152-81 to SecDef, 29 Apr 81 (JCS 2430/349-6), JMF 721 (11 Aug 80). (U) Interview, Willard J. Webb with LCDR R. M. Rieve, USN, JSR Div., C3S Dir., 9 Apr 82.

control, and communications systems was incorporated into Congressional testimony by various defense officials. With the establishment of the Command, Control, and Communications Systems Directorate in the Joint Staff, its Director, General Dickinson, USA, began to testify before Congressional committees. During those appearances, he stressed the need for action in the command and control area. In his first testimony before the Senate Armed Services Committee, in April 1980, he pointed to the establishment of his directorate as indication of "the importance" accorded to command, control, and communications. One of his "key observations" to the Committee was that the command, control, and communications portion of the US fighting system was out of balance. It was behind, he said, and "we are dedicated . . . to rectify that balance." He pressed this theme in subsequent Congressional appearances.<sup>46</sup>

(f) This attention in the Department of Defense, in the Administration, and in the Congress resulted in increased funds for command, control, and communications. In the early 1970s, funding for this purpose had remained flat. The increase between the 1970 and 1974 budgets was \$500 million for a total of \$6.0 billion and, in view of the inflation, amounted to little increase at all.<sup>47</sup> In the FY 1980 budget, approved in 1979, command, control, and communications received \$7.8 billion,<sup>48</sup> an increase of only \$1.8 billion in six years. Thereafter, there was a marked increase. For FY 1981, President Carter budgeted \$9.70

46. (U) Testimony, LTG Dickinson, Dir C3S, Hearings, DOD Authorization for Appropriations for FY 1981, S. Cmte on Armed Services, 96th Cong, 2d sess, Part 6, pp. 3408-3414.

47. MG Van C. Doubleday, "The C3 Business," Signal Magazine, Feb 80, p. 21.

48. Figures are in "then year dollars"--the amount at the time of appropriation without subsequent adjustment for inflation.

billion. Subsequently, President Ronald Reagan raised that figure slightly to \$9.77 billion, and the Congress appropriated even more--a total of \$10.02 billion, of which \$1.73 was for strategic command, control, and communications.<sup>49</sup>

~~(u)~~ Just a few days before leaving office in January 1981, President Carter submitted the FY 1982 budget that included an increase of \$1.5 billion over his previous budget for command, control, and communications, raising the total amount to \$11.2 billion. Immediately, upon entry into office, President Reagan initiated a review of the FY 1982 budget, and the new Administration submitted a revised Defense budget that increased the command, control, and communications figure to \$12.4 billion.<sup>50</sup>

~~(u)~~ The Congress thought even more funds were needed for command, control, and communications. Senator John W. Warner held special hearings on this matter before the Subcommittee on Strategic and Theater Nuclear Forces of the Senate Armed Services Committee in March 1981. He was particularly interested in recommendations for improvements in the strategic command, control, and communications systems beyond those provided for in the revised budget. Mr. Harry Van Trees, the Acting Assistant Secretary of Defense (Command, Control, Communications and Intelligence); General Richard H. Ellis, Commander of the Strategic Air Command and Director of the Joint Strategic Connectivity Staff; Lieutenant General James V. Hartinger, USAF, Commander of North American Aerospace Defense; and Lieutenant General Dickinson all testified and supported further improvements. General Dickinson stressed the

49. ~~u~~ Statistical Tables, Att to Memo, Dir C3 Resources, OSD to Dr. Babcock et al., 6 Mar 81, C3S files. (U) Viewgraph prepared by C3S, "C3 Funding, FY 1980-1983," n.d. Apr 82, C3S files.

50. ~~u~~ Statistical Tables, Att to Memo, Dir C3 Resources, OSD to Dr. Babcock et al., 6 Mar 81, C3S files.

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following ordering of priorities to realize a viable command, control, and communications system. First, he listed the provision of unambiguous warning of enemy attack to the National Command Authorities and a survivable connectivity to pass National Command Authority orders to the forces. Current warning and communications systems, General Dickinson said, were not protected against the effects of high-altitude bursts (including electromagnetic pulse, scintillation, and blackout), jamming, or sabotage. Second, he called for attack assessment information that identified for the National Command Authorities the nature of attack by location and scope to allow flexibility in response strategies. Finally, he said, information of the status of surviving forces, both friendly and enemy, was necessary for reconstitution and follow-on response.<sup>51</sup>

(U) As a consequence of these hearings, the Subcommittee recommended and the Congress appropriated additional funds for strategic command, control, and communications in the amount of \$136.4 million above what President Reagan had requested. (For a breakdown by specific program, see Table 1.) The Congress deleted, however, some funds in other areas of the command, control, and communications program and the total appropriated for command, control, and communications overall amounted to \$12.33 billion for FY 1982 or approximately \$70,000 less than President Reagan had sought in his revised budget.<sup>52</sup> See Table 2 for a comparison of appropriations for command, control, and communications for FY 1980 through FY 1983.

51. (S) Testimony of LTG Dickinson, Hearings, FY '82 DOD Military Authorization Request, Strategic Command, Control, and Communications, Subcmte on Strat and Theater Nuc Forces, S. Comm on Armed Services, 97th Cong., 1st sess., pp. 26-37. (S) Ltr, Dir C3S (Dickinson) to Senator John W. Warner, 16 Apr 81, C3S files.

52. (S) C3S Statistical Table, "Recommended C3 Package with CINC's Priorities," n.d., C3S files. (U) Viewgraph prepared by C3S, "C3 Funding, FY 1980-1983," n.d. [Apr 82], same file.

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TABLE 1

Strategic Command, Control, and Communications Programs for  
which the Congress Appropriated Money in the FY 1982 Budget  
Beyond what the President Requested

<u>Program</u>	<u>Amount (in millions)</u>
PAVE PAWS Expansion	\$ 3.8
Communication Propagation through Scintillation Effects	\$ 5.2
Electromagnetic Pulse Hardening- Critical Facilities	\$ .2
PACCS Electromagnetic Pulse Hardening	\$ 2.0
Satellite Coverage Continuity	\$65.0
Multi-Mission SATCOM (EHF)	\$56.2
Electrical Power Modernization Program	\$ .5
Survivable, Enduring Communications	\$ 3.5
<b>Total</b>	<b>\$ 136.4</b>

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TABLE 2

C3 FUNDING  
(\$ B)

FUNCTIONAL AREA	1980 APPROPRIATIONS	1981 APPROPRIATIONS	1982 APPROPRIATIONS	1983 PRESIDENT'S BUDGET	
				1982 APPROPRIATIONS	1983 PRESIDENT'S BUDGET
STRATEGIC C3	1.50	1.73	2.49	2.87	
THEATER/TACTICAL C3	3.48*	1.39	1.95	2.54	
WARFARE-RELATED C3		1.83	1.82	1.99	
DEFENSE-WIDE C3	2.82	3.80	4.52	5.51	
ELECTRONIC WARFARE		1.27	1.55	1.83	
TOTAL (THEN YEAR DOLLARS)	7.81	10.02	12.33	14.74	
TOTAL CONSTANT FY83 DOLLARS	10.02	11.50	13.11	14.74	

\*NEW FUNCTIONAL AREA DEFINITIONS DIVIDED THEATER/TACTICAL FUNDING

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Progress, 1978-1980

(U) The various reviews, organizational developments, and budgetary increases to strengthen strategic connectivity did bring progress. A number of improvements had been accomplished by the end of 1980. One of the most significant was the upgrading of the National Emergency Airborne Command Post (NEACP) aircraft. Consolidated budget guidance in 1978 had called for the conversion of the current E-4A to E-4B configuration in order to improve communications performance and survivability by increasing range, hardening against electromagnetic pulse, and strengthening resistance to jamming, and the Strategic Air Command connectivity study had recommended acceleration of this program. Necessary planning and programming proceeded, and the first E-4B became operational during 1980. Simultaneously, two E-4As were planned for retrofit to E-4B configuration. In addition, the FY 1982 budget, prepared during the fall of 1980 and submitted to the Congress the following February, included provision for retrofit of a third E-4A, and planning called for acquisition of two new E-4Bs in FY 1983 and 1984. The result would be a fleet of six E-4Bs for National Emergency Airborne Command Post operations.<sup>53</sup>

Improvement also occurred in the warning area. The percentage of missile launch detections by the Defense Support Program (DSP) radars increased in the period 1978 through 1980 from approximately 60 to 96 percent. In addition, two Phased Array Radar Warning System (PAVE PAWS)

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53. All information on the progress in the period 1978-1980, unless otherwise stated is from the C3S Semiannual Reports on Performance Evaluation of Command, Control and Communications Systems (C3 Systems Evaluation Reports) for Oct 78, Apr 79, Oct 79, Apr 80, Oct 80, and Apr 81, JMF 360 (22 Apr 78), (27 Oct 78), (11 May 79), (14 May 80), and (11 May 81).

sites became operational in 1980 greatly improving the ground-based detection and warning against sea-launched ballistic missiles. The two sites, one in Massachusetts and one in California, each had a range of 3,000 miles. They operated in conjunction with the Defense Support Program satellites to confirm launch reports, provide missile impact predictions, determine the number of missiles in an attack, and pinpoint probable targets. This new radar system was deficient, however, in two areas. It did not provide complete coverage of all potential threat areas and had only a limited attack characterization capability against sea-launched missiles with multiple, independently-targeted reentry vehicles. Finally, by the close of 1980, warning had been further strengthened by improvement in the Defense Support Program data survivability through provision of mobile ground terminals.

→ The survivability of strategic connectivity systems was increased as well. During 1980, funds were requested to harden critical landlines and TACAMO, E-4A, and EC-135 aircraft. In addition, programs were underway to upgrade command centers in the US European Command and the North American Aerospace Defense Command Consolidated Operations Center (CSOC) and to develop ground mobile command posts.

→ Another major action to strengthen strategic connectivity in the period 1978-1980 was initiation of efforts to provide a system for nuclear detonation (NUDET) surveillance information. The Strategic Air Command connectivity study had set forth a need for an enduring system to confirm US weapons detonations on enemy targets as well as to assess enemy attacks on the United States and its allies. As a result, planning began for the Integrated Operational Nuclear Detection System (IONDS), which involved placing sensors on Global Positioning System (GPS) satellites. Secretary of Defense Harold Brown approved the system in August 1979, and the US Air Force issued the

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necessary management directive for the system later in the year.<sup>54</sup>

~~(S)~~ Other strategic connectivity developments in the same period were improvement in the airborne computer support program for the Post Attack Command Control System (PACCS), already the most survivable element of the US command, control, and communications system; and increased Emergency Rocket Communications System (ERCS) sorties and selection of silo launcher locations to increase launch survivability. These latter actions were designed to enhance the probability of Emergency Rocket Communications System "flyout" through a hostile environment.<sup>55</sup> Finally, in accord with the Strategic Air Command connectivity study, the Secretary of Defense directed in December 1980 procurement of high frequency radios to improve communications for presidential helicopters.<sup>56</sup>

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54. (TS) CINCSAC Command History, 1979, pp. 80-82.

55. Ibid., pp. 83-86, 124-125.

56. (S) Memo, SecDef to SecNav, 24 Dec 80, Att to JCS 2308/909, 22 Jan 81, JMF 360 (24 Dec 80).

### **The Reagan Administration—Increased Emphasis**

(U) On 20 January 1981, Ronald Reagan succeeded Jimmy Carter as President of the United States. The new President had made the adequacy of the US defense posture an issue in his campaign, and he entered office committed to bolstering US military strength. As discussed in the previous section, President Reagan undertook an immediate review of the FY 1982 Defense budget prepared by the outgoing Administration. Among other things, this review brought an increase in the funding request for command, control, and communications, and this initial interest by President Reagan and his advisers in command and control, including strategic connectivity, continued in the succeeding months.

#### **The Strategic Connectivity Briefing**

(U) An important factor in securing the new Administration's attention to strategic connectivity was a briefing on this matter prepared in the Command, Control, and Communications Systems Directorate of the Joint Staff. General Dickinson, himself, began this project. He used a systems approach, placing command, control, and communications requirements in a matrix. Initially, he employed colored dots for functional areas such as warning with sensor and radar systems. The color indicated the current capability of the system. Green was good, yellow marginal, and red deficiency. Later, the matrix was translated into a pictorial approach with slides and viewgraphs. The briefing was kept current with appropriate color changes as improvements were made.<sup>1</sup>

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1. (U) Interview, Willard J. Webb with LGEN Hillman Dickinson, USA, Dir C3S, 25 Feb 82. (U) Interview, Willard J. Webb with LTC Mark H. Smith, USAF, PPB Div., C3S Dir., 26 Feb 82.

(C) General Dickinson gave the strategic connectivity briefing to the Operations Deputies on 1 April 1981.<sup>2</sup> Thereafter, it was used widely in presentations to Reagan Administration officials. Recipients included the Under Secretary of Defense (Research and Engineering) and his staff, including the Deputy Under Secretary for Command, Control, Communications, and Intelligence; the new Secretary of Defense, Caspar W. Weinberger, and his Deputy, Frank C. Carlucci, during the Secretary's first JCS performance review in July 1981; and members of the White House and National Security Council staffs, including the President's science adviser. In addition, General Dickinson used portions of the briefing in testimony before the Subcommittee on Strategic and Theater Nuclear Forces of the Armed Services Committee. The result was an increased awareness of the fragile condition of strategic connectivity, both in warning capability and emergency action message transmission.<sup>3</sup>

#### The Wade Study

Early on, the Reagan Administration initiated a review of strategic connectivity. The issue arose over consideration of the Extremely Low Frequency (ELF) Communications System. This system would permit communication with nuclear submarines at covert depths and speeds. Currently, in order to receive or transmit messages, these submarines had to operate at or near the surface and at reduced speeds in order to deploy an antenna.

2. Briefing, LGEN Dickinson to OpsDeps, "Strategic Connectivity (U)," 1 Apr 81; (U) Note to AMD, "Strategic Connectivity (U)," 1 Apr 81; JMF 360 (7 Mar 79) sec 3.

3. (U) Interview, Webb with LTC Smith, 26 Feb 82. (U) Interview, Willard J. Webb with Mr. Joseph Toma, C3 Systems Evaluation Div., C3S Dir., 24 May 82. (TS) Draft Briefing on C3, CJCS to SecDef (Weinberger), n.d., C3S files. (U) C3SM-802-81 to CJCS, 29 Oct 81, CJCS Files 035 C3.

This, of course, greatly increased the chance of detection, and the Extremely Low Frequency System would reduce this vulnerability. The Carter Administration had approved a small extremely low frequency test transmitter facility in Wisconsin and plans called for a second facility in Minnesota. Then, suddenly, on 20 March 1981, the Secretary of the Navy questioned the necessity for the system because of the expense and the lack of survivability of the system. In reaction, President Reagan asked about the matter. He was particularly concerned about the political reaction against the test facility in Wisconsin and wanted Deputy Secretary of Defense Carlucci to look into the question. Rather than just an assessment of the extremely low frequency system, the Deputy Secretary proposed to consider the system in the overall context of strategic connectivity. The Secretary of Defense and the President agreed and work began on the study on 24 April 1981.<sup>4</sup>

(S) President Reagan, however, did not await the results of this broad connectivity study to make a decision on the Extremely Low Frequency System. In April, he elected to continue further testing at the Wisconsin facility prior to deciding on a second site.<sup>5</sup>

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4. (TS-EX) C3 Systems Evaluation Report, Oct 81, pp. IV-55 - IV-56, JMF 360 (11 May 81). (U) Draft Memo, DepSecDef to President, "Extremely Low Frequency (ELF) Communication System," n.d. (late Mar 81); Memo, DepSecDef to SecNav and USecDef(R&E), "ELF Communication System," 28 Jul 81; (S) Draft Memo, Attn USecDef(R&E) to SecDef and DepSecDef, "Presidential Decision Required for An Extremely Low Frequency (ELF) Communications System - ACTION MEMORANDUM," n.d. (late Mar 81); OSD (C3I) files. Interview, Willard J. Webb with COL Robert Leahy, USAF, OSD(C3I), 26 Feb 82. (TS-EX) Wade Report, Strategic Connectivity Review Summary Report, 5 Aug 81, C3S files.

5. (TS-EX) C3 Systems Evaluation Report, Oct 81, p. IV-56.

(U) Meantime, the strategic connectivity review was carried out by a special executive review board headed by Dr. James P. Wade, Jr., Principal Deputy Under Secretary of Defense (Research and Engineering) and with members from the Services, the Joint Chiefs of Staff<sup>6</sup>, the Deputy Secretary of Defense for Policy, the Deputy Under Secretary for Command, Control, Communications, and Intelligence, the Assistant Secretary of Defense (Program Analysis and Evaluation), the Defense Nuclear Agency, the Defense Communications Agency, and the Joint Strategic Connectivity Staff. A working group of representatives of the members did the actual work of the review.

457) Dr. Wade submitted the completed report, known thereafter as the "Wade Study," to the Secretary of Defense on 5 August 1981. It confirmed the finding of the Strategic Air Command and Navy connectivity studies two years earlier --that the United States could not carry out its national policy because of command, control, and communications weaknesses. The Wade Study was even more significant than the earlier studies, however, because it was more broad-based. It had been prepared by and had the backing of not only the Joint Chiefs of Staff, but also the Services, the Office of the Secretary of Defense and the concerned Defense Agencies.

458) The Wade Study presented the following conclusions: (1) improvements in the Soviet Union's nuclear warfare capability over the past decade seriously threatened US strategic command, control, and communications capability, in both initial nuclear exchanges and in protracted nuclear war; (2) current command, control, and communications would not provide assured support for an effective initial response to a nuclear attack on the United States; (3) the

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6. The Joint Chiefs of Staff were represented by LGEN Dickinson, USA, Director, C3S.

current US command, control, and communications systems were not endurable and would not support the intelligent prosecution of a protracted nuclear war; (4) planned organization and coordination of surviving post-attack command, control, and communications systems and weapons systems were inadequate; (5) the United States could not assure survivability, endurability, or connectivity of the national command authority function. These conclusions flowed from major command, control, and communications deficiencies: in tactical warning and attack assessment where existing systems were vulnerable to disruption and destruction from electromagnetic pulse, other high altitude nuclear effects, electronic warfare, sabotage, or physical attack; in decision-making where there was inability to assure national command authority survival and connection with the nuclear forces, especially under surprise conditions; and in communications systems, which were susceptible to the same threats as above and which could not guarantee availability of even minimum-essential capability during a protracted war.

The Wade Study recognized the impossibility of attaining perfect strategic command, control, and communications at all times and under all conditions. Nonetheless, it did believe it possible to upgrade the US strategic system to assure "a reasonable probability of effectiveness" and to give decision-makers the ability to defend the United States effectively and achieve national objectives. To that end, the Study presented two packages of recommended actions. The first contained procedural changes to be implemented as soon as possible and, in addition, "programmatic actions" to be funded in the FY 1983 budget. The second package included actions for the FY 1984-1988 budgets. Both packages were separated into categories of tactical warning and attack assessment, decision-making, and communications. (For the specific

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recommendations, see Annex H.) Estimated FY 1983 funding for actions in the first package amounted to \$1.9 billion. Current programming allocated only \$1.2 billion for this purpose, resulting in a \$.7 billion shortfall. The total cost of both recommended packages of the Wade Study was \$14.7 billion while current programming provided only \$10.4 billion for an overall estimated shortfall of \$4.3 billion.<sup>7</sup>

#### The Launch Under Attack Paper

~~(top)~~ While the Wade Study was in preparation, consideration of "launch under attack" (LUA) options also brought the adequacy of existing and planned systems for strategic connectivity to the attention of the Reagan Administration. During the spring of 1981, Dr. Richard D. DeLauer, Under Secretary of Defense (Research and Engineering) asked the Joint Chiefs of Staff about the ability of command, control, and communications systems to survive and get emergency action messages to the strategic forces in various launch under attack situations. In response, the Command, Control, and Communications Systems Directorate prepared an appropriate assessment under two situations—when both sides were alert or "fully generated" and when the United States was attacked under surprise conditions with its forces in routine alert posture. For enemy attack scenarios, the Command, Control, and Communications Systems Directorate relied on the current Red Integrated Strategic Operations Plan (RISOP), recognizing that actual enemy attacks might be "markedly" different. The Command, Control, and Communications Systems Directorate concluded that, in a fully generated posture, the probability of command, control, and communications systems

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7. (TS-EX) Wade Report, "Strategic Connectivity Review, Summary Report," 5 Aug 81, C3S files.

supporting assured execution of launch under attack options was "extremely low." The reason was that no combination of systems and procedures was fast enough to complete the process of warning assessment, decision-making, and emergency action message dissemination in the time available (3.5 minutes) between the first submarine-launched ballistic missile breakthrough and attacks on command, control, and communications systems. With regard to an attack under surprise conditions, the Command, Control, and Communications Systems Directorate considered the chance of current systems supporting launch under attack options as "moderate to high" for Intercontinental Ballistic Missiles, "moderate" for bombers, and "low" for nuclear submarines. If initial or "precursor" attacks were optimized for command, control, and communications degradation, however, the probability of such systems supporting assured execution of launch under attack options was "low" for all force elements. The Command, Control, and Communications Systems Directorate listed a number of improvements needed to bring the probability of assured command, control, and communications support for launch under attack options to an acceptable level. (See Annex I.) General Dickinson presented the launch under attack paper to the Operations Deputies as well as to Dr. DeLauren.<sup>8</sup>

#### Nuclear Weapons Employment Policy and C3

(TS) Review of nuclear weapons employment policy also raised questions about strategic connectivity for the Reagan Administration. In July 1981, the Under Secretary of Defense for Policy submitted a draft of a new policy statement on this matter to the Secretary of Defense.

8. (TS-EX) C3S Paper, "Launch Under Attack (LUA)," n.d. (Jun 81), C3S files. (U) Interview Willard J. Webb with LTC Jessie K. Crawford, USAF, C3S Dir., 29 Mar 82.

Basically, the proposed statement continued the nuclear weapons employment policy developed by the Nixon Administration<sup>9</sup> and reaffirmed by Presidents Ford and Carter. Among the new features, the draft statement placed greater emphasis on the secure reserve force (SRF)--"the subset of our strategic forces that could be withheld during a nuclear war and would be capable of enduring survival." The draft included provision of an increase in the secure reserve force over the next two years to allow for a greater role and increased flexibility in its employment.<sup>10</sup>

~~TOP SECRET~~ The Joint Chiefs of Staff reviewed the draft nuclear weapons employment policy and, among other things, doubted the ability of command, control, and communications systems to support an expansion of the secure reserve force. (The Secure Reserve Force Study in 1978<sup>11</sup> had reached this same conclusion.) Consequently, they questioned any plans to expand use of the force without requisite improvements in command, control, and communications. They recommended that the guidance be modified to state: "the Secure Reserve Force shall be increased over time as improvements to both forces and related C3I permit greater roles for it and increased flexibility in its employment." Subsequently, the Under Secretary of Defense revised the draft statement to incorporate the JCS recommendation regarding the secure reserve force.<sup>12</sup>

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9. See above, p. 13-14.

10. (TS-EX) Memo, USecDef(P) to SecDef, 14 Jul 81, Att to JCS 2430/363, 16 Jul 81, JMF 721 (14 Jul 81).

11. See above, pp. 27-28.

12. (C-EX) JCSM-282-81 to SecDef, 24 Jul 81 (JCS 2430/363-1); (TS-EX) DJSM 1382-81 to USecDef(P), 24 Jul 81, Att to JCS 2430/363-2, 3 Aug 81; (TS-EX) Memo, USecDef(P) to SecDef, 7 Aug 81, Att to JCS 2430/363-4, 13 Aug 81; JMF 721 (14 Jul 81).

### The President's Decision on Strategic C3

(S) The results of the Wade Study together with the conclusions concerning the launch under attack options and the secure force convinced President Reagan that stronger action must be taken to improve strategic connectivity. On 1 October 1981, the President approved a "Strategic Forces Modernization Program." It included five "mutually reinforcing" parts: (1) making strategic communications and command systems more survivable to assure connectivity with the nuclear commanders; (2) modernizing the strategic bomber force by the addition of two new aircraft; (3) increasing the accuracy and payload of the submarine-launched ballistic missiles and adding sea-based cruise missiles (SLCM); (4) improving strategic defenses; (5) deploying a new, larger, and more accurate land-based ballistic missile. The President gave the first item "the highest priority" in the program. The objective was to develop command and communications systems for the strategic forces that could survive and endure before, during, and after a nuclear attack. "We do not," he said, "have such systems now." Financial resources required for the entire modernization program would be derived from currently planned and approved Defense budget allocations and any overruns would be absorbed by reprogramming within the agreed budget ceiling.<sup>13</sup>

(U) The President's modernization program provided for improvement in strategic command, control, and communications in three areas: the survivability, performance, and coverage of warning system radars and satellites; the survivability and capabilities of the command centers that would direct US forces in a nuclear war; and the communications systems that linked the command

13. (S-EX) NSDD 12, 1 Oct 81; (S-EX) Memo, Asst to Pres for NSA to V. Pres et al., "Strategic Forces Modernization," 1 Oct 81; JMF 001 (CY 81) sec 2.

centers with the legs of the strategic triad. In the warning area, the program included deployment of mobile ground terminals to process data from satellites and upgrading of the satellites themselves. To enhance command centers, the President called for deploying E-4B aircraft command posts, hardening of EC-135 aircraft command posts against nuclear effects, and equipping the EC-135 command posts with upgraded satellite and very low frequency/low frequency communications. The measures to improve communications systems were development and installation of very low frequency/low frequency receivers on strategic bombers, improvement in communications to deployed submarines, and development of a new satellite communications system to provide extremely high frequency (EHF) channels to insure two-way communication between commanders and their forces.<sup>14</sup>

(A) At a news conference the following day, President Reagan announced his decision on strategic weapons modernization. The program had three objectives, he said: to act as a deterrent against any Soviet actions, to provide the capability to respond to any further growth in the Soviet forces, and to signal US resolve. The President then listed the aspects of the program. In the public listing, improvement in communications and control systems was fourth, and the President gave no indication that he had assigned this area the highest priority among the programs. In the questioning that followed, the reporters did not ask about the command, control, and communications aspects of the modernization.<sup>15</sup>

14. (U) White House News Release, "The Reagan Strategic Program," 2 Oct 1981.

15. (U) President Reagan, "United States Strategic Weapons Program," Remarks and a Question-and-Answer Session with Reporters, 2 Oct 81, Weekly Compilation of Presidential Documents, 5 Oct 81, pp. 1074-1076. (U) SecDef Briefing of Newsmen at White House, "Strategic Weapons Systems," 2 Oct 81, OSD Historical Office files.

(TS) Two and a half weeks later, on 19 October 1981, President Reagan approved a new nuclear weapons employment policy that reinforced the importance of strategic connectivity. The policy called for "substantial improvement" in forces and the supporting command, control, and intelligence systems to assure the required flexibility, endurance, and effectiveness in a nuclear war of indefinite duration. The new policy also provided for a secure reserve force that could be employed after an extended "withhold period." The President implicitly recognized the JCS contention that such a force could not be expanded without improvement in command, control, and communications systems, and the approved policy statement contained the language recommended by the Joint Chiefs of Staff<sup>16</sup> that the secure reserve force should be increased only as rapidly as improvements to both forces and related command, control, communications, and intelligence permitted.<sup>17</sup>

#### The FY 1983 Budget

(U) While the President and his advisers were considering the strategic weapons modernization program and a new nuclear weapons employment policy, work had proceeded on the FY 1983 Defense Budget. In June 1981, Deputy Secretary of Defense Carlucci issued revised guidance to strengthen the planning phase of the Planning, Programming, and Budgeting (PPB) System. For the command, control, and communications area, he directed the Joint Chiefs of Staff to take the lead in planning systems to support the unified and specified commands. Such plans, he said, should highlight "cross-Service, cross-command, cross-program, and international requirements." The Secretary of Defense's staff would provide "guidance, direction, and necessary

16. See above, p. 67-68.

17. (TS) NSDD 13, 19 Oct 81, JMF 001 (CY 81) sec 2.

coordination" to insure integration of systems requirements to meet the Secretary's goals and priorities.<sup>18</sup> Work on the FY 1983 budget was already well advanced when this new directive was received and, although it had little effect on the FY 1983 process, it promises to be of much importance in preparation of future command, control, and communications budgets.

(b) Guidance for the Five-Year Defense Program (FYDP), FY 1983-1987, for command, control, and communications called for significant improvement in missile warning and in connectivity with the strategic forces in the early phase of nuclear conflict. Actions to accomplish these goals included: enhancement of the survivability of the Defense Support Program (DSP) satellite system; modernization of airborne command posts by buying E-4B aircraft and hardening existing EC-135 aircraft; provision of sufficient TACAMO aircraft to support the Pacific nuclear submarines; acquisition of super high frequency (SHF) transponders; development and partial funding for an Integrated Operational Nuclear Detonation System (IONDS); and development of the Reconstitutable Enduring Satellite Communications (RESC) System (a system to reconstitute an austere satellite communications network following an enemy first strike).<sup>19</sup>

(c) The Services prepared their Program Objective Memoranda (POMs) for the FY 1983 budget to meet the Five-Year Program objectives, and the Secretary of Defense reviewed them. For the strategic command, control, and communications area, he thought additional funding was required to meet the recommendations of the recently

18. (U) Memo, DepSecDef to Secys of MilDepts, CJCS, et al., 12 Jun 81, Att to JCS 2522/101, 22 Jun 81, JMF 555 (12 Jun 81).

19. (U) DOD Program Review, FY 83-87, Final Draft, Att to Memo, Exec Secy, DRB to SecDef et al., 4 Aug 81, C3S files.

completed Wade Study. Accordingly, the Secretary's Program Decision Memoranda added approximately \$.64 billion for strategic command, control, and communications systems above the amount of the recommended Service programs for a total of \$2.61 billion.<sup>20</sup> Thereafter the Services prepared budget revisions, the Budget Estimate Submissions (BES), to conform with the Program Decision Memoranda. In the final Department of Defense budget review that followed, still more funds (approximately \$.26 billion) were added for strategic command, control, and communications systems, and the final DOD Program Budget Decision (PBD) resulted in a total of \$2.87 billion. Thus the Secretary of Defense approved the addition of almost a billion dollars for strategic command, control, and communications systems in the FY 1983 Defense Budget beyond what the Services had initially requested.<sup>21</sup> This increase, undoubtedly, reflected the President's decision to give command, control, and communications first priority in strategic weapons modernization.

(U) The \$2.87 billion figure for strategic command, control, and communications was incorporated into the President's FY 1983 budget, submitted to the Congress in early February 1982, without change<sup>22</sup>. (If funding for various satellite programs, which support strategic command,

20. (S-EX) Memos, DepSecDef to CJCS et al., "Program Decision Memorandum for Defense Agencies and Defense-wide Programs (U)," 2 Oct 81; DepSecDef to SecAF, "Program Decision Memorandum for the Dept. of the Air Force (U)," 2 Oct 81; DepSecDef to SecNav, "Program Decision Memorandum for the Dept. of the Navy (U)," 2 Oct 81; DepSecDef to SecArmy, "Program Decision Memorandum for the Dept. of the Army (U)," 2 Oct 81; JMF 557 (2 Oct 81). (S) C3S Paper, PDM Evaluation - C3 Systems," n.d. (Oct 81), C3S files.

21. (U) OSD Paper, "C3I Interim Status Report, FY 83 Budget by Mission Area," n.d. (Jan 82); (U) C3S Viewgraph, "C3 Funding, FY 1980-1983," n.d. (Apr 82); C3S files.

22. Pres, Msg to the Congress transmitting FY 1983 Budget, 8 Feb 82, Weekly Compilation of Presidential Documents, 15 Feb 82, pp. 129-142.

control, and communications were added, the total amount increased even further to \$3.74 billion.<sup>23)</sup> The total command, control and communications program in the President's FY 1983 budget amounted to \$14.74 billion. The figures are important, but even more important is the trend. A comparison of funding for command, control, and communications shows a significant increase over the past four years (See Table 2, p. 56 above.) Funding for command, control, and communications overall increased by approximately 47 percent; for strategic aspects of the program, the increase was over 90 percent.<sup>24)</sup>

#### Progress During 1981

(U) The President's modernization program for strategic command, control, and communications systems, together with the funding increases in the FY 1983 budget to initiate that program, promised major improvements in strategic connectivity. It would take several years, however, to see the effects of these planned improvements. Even so, there were advances in strategic connectivity in 1981.

(U) During the year command posts were strengthened. In the continuing program to improve the National Emergency Airborne Command Post (NEACP)<sup>25)</sup>, the first E-4A aircraft was "input" for hardening and retrofit to E-4B configuration in October 1981. The second E-4A was scheduled for retrofit in October 1982. Meantime, the Commander of the Strategic Air Command indicated that he intended to use upgraded EC-135 aircraft for his continuously airborne command post and had no requirement for the E-4B. As a consequence, the Air Force deleted plans to buy two additional E-4Bs from its FY 1983 Program Objective Memorandum. This action would

23. (S) OSD Paper, "Strategic C3 FY 1983 Budget Estimate Submission," 25 Nov 81, C3S files.

24. (U) C3S Viewgraph, "C3 Funding, FY 1980-1983," n.d. (Apr 82), C3S files.

25. See above, p. 57 for earlier aspects of this program.

result in a fleet of four E-4B aircraft to maintain ground alert posture for the National Emergency Airborne Command post.<sup>26</sup>

(2) Another action in the command post area in 1981 was the equipping of the airborne command posts of the nuclear commanders with AFSATCOM terminals, thereby increasing the redundancy for Single Integrated Operational Plan (SIOP) communications. In addition, 70 percent of the Strategic Air Command bombers were equipped with AFSATCOM terminals further strengthening the survivability of communications with the nuclear forces.

(3) Plans for enhancement of the Alternate National Military Command Center moved ahead as well. An estimate for installation of secure conferencing had been completed; a requirement for a secure video link between the Center and the Federal Emergency Management Agency (FEMA) was developed; mobile satellite terminals had been requested as had funds for electromagnetic pulse protection for the Center's power source; and a required operational capability was being prepared for a high frequency upgrade of the facility.

(4) In the area of communications, very low frequency/low frequency (VLF/LF) tests during 1981 demonstrated the technical interoperability of the 616A (Air Force) and the VERDIN (Navy) systems. As a result, installation of 616A modems began on the airborne command posts of the nuclear commanders. This new equipment would allow interoperability with the Navy very low frequency systems and supply an anti-jamming capability. The 616A and the VERDIN, when fully operational, would become part of the very low frequency/low frequency component of the Minimum Essential Emergency Communications Net (MEECN).

26. All information on strategic connectivity improvements in 1981 is from (TS) C3S Evaluation Report, Oct 81, JMF 360 (11 May 81) sec 2, and (TS) C3S Evaluation Report, Apr 82, JMF 360 (17 Jun 82).

Other communications developments were the President's approval in April 1981, as described above<sup>27</sup>, to continue the Extremely Low Frequency (ELF) Communications System test facility in Wisconsin and the subsequent approval on 8 October 1981 for a second site in Minnesota. In addition, in July 1981, three installations of the AUTODIN II network became operational and a fourth installation was added in October 1981. This system was designed to improve the transmission of computer data, but questions quickly arose. Further development of the system is now in doubt.

In the warning and assessment area, the recommendations of the Command, Control, and Communications Systems Directorate Umbrella Study<sup>28</sup> were being monitored by the Joint Strategic Connectivity Staff to insure accomplishment. To support the President's strategic weapons modernization program, various improvements to tactical warning and attack assessment systems were approved for implementation though none were yet operational. These included: for the Defense Support Program (DSP) - satellite sensor enhancements, mobile ground processing stations, and upgrading of the Ground Communications Network (GCN); for the Ballistic Missile Early Warning System (BMEWS) - missile and radar upgrading and provision of electronic countermeasures "analyzers"; for the Sea-Launched Ballistic Missile (SLBM) radar system - addition of two PAVE PAWS sites in the southeast and southwest United States and a power upgrade for the existing PAVE PAWS sites.

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27. See above, p. 63.

28. See above, pp. 46-48.

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(U) In the four years, 1978 through 1981, great progress was made in strengthening strategic connectivity. Its tenuous nature had been brought to the attention of the Joint Chiefs of Staff, the Secretary of Defense, and the President. In response, the President had approved a strategic weapons modernization program that gave highest priority to the area of communications and command systems. To carry out this program, the President approved a FY 1983 budget that represented a 90 percent increase over the level of four years earlier for strategic command and control. Survivable and enduring strategic connectivity still remained to be achieved, but movement toward that goal was real.



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